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SEP 30 2008

BEFORE THE SURFACE TRANSPORTATION BOARD

STB FINANCE DOCKET NO. 35160

OREGON INTERNATIONAL PORT OF COOS BAY
—FEEDER LINE APPLICATION—
COOS BAY LINE
OF THE CENTRAL OREGON & PACIFIC RAILROAD, INC.

SUPPLEMENTAL REPLY OF THE OREGON INTERNATIONAL PORT OF COOS BAY

Exhibit 3

Bridge Report

Office of Frooeedings

OCT -1 2008

Pert of Public Record



September 26, 2008

Mr. Michael Gaul Port of Coos Bay P. O Box 1215 Coos Bay, OR 97420

SUBJECT: COOS BAY RAIL LINK (LINE) BRIDGE CONDITION ASSESSMENT

Dear Mike

Enclosed is the Final Bridge Condition Assessment Report for the Coos Bay Rail Link in accordance with Task 5 of our contract. We have completed a review of the 2007 Osmose Railroad Services, Inc. Bridge Inspection Reports and conducted visual inspections of the bridges on the Line. We have developed opinions of anticipated bridge costs associated with resuming rail operations, along with short and long-term bridge system costs and costs to remove the bridge system and replace all bridges with new structures. This report documents our study methodology and findings

As you know, David Evans and Associates, Inc (DEA) is a national leader in sustainable design and management solutions, and has consistently provided its clients with award-winning approaches to transportation, energy, water resources, and land development design, planning, and management. As a result, the company has consistently ranked among Engineering News Record's Top 100 Pure Design firms in the U.S. and among the leaders in many of its local markets.

We have extensive experience in transportation projects, especially in Oregon, and have the capability to provide design-build services for our projects. In July 2008, the ODOT Rail Division retained our to firm prepare a Bridge Condition Study on 331 significant (length greater than 100 feet) short line railroad bridges, which included bridges from nearly all short lines in the state. Our cost estimates are based upon our extensive experience with bridge work in the Pacific Northwest, as well as experience derived from ODOT Rail's Bridge Condition Study

In the last two years, we have successfully delivered design and construction engineering services for six Coos County bridges. We are a recognized leader for steel truss bridge rehabilitation in Oregon and have most recently been selected to provide professional design and construction engineering services for the rehabilitation of the Coos Bay Railroad Bridge, which is a significant steel truss bridge. We have a unique understanding of the cost of construction in Coos County. For more about DEA, please visit our web site at www.deainc.com.

If you have any questions, please call me at (503) 361-8635

Sincerely,

DAVID EVANS AND ASSOCIATES, INC.

Jeff Parker, P E. Project Manager

cc: Sandra Brown, Troutman Sanders LLP

Coos Bay Rail Link Bridge Condition Assessment



Prepared for:

Oregon International Port of Coos Bay

September 26, 2008

Prepared by:



Project Background

The Oregon International Port of Coos Bay (Port) is seeking to acquire the Coos Bay Rail Link (Line) from the Central Oregon & Pacific Railroad, Inc (CORP) The location of the Line is between milepost 652 114, near Danebo, OR and milepost 763 130, near Cordes, OR. The Port retained David Evans and Associates, Inc (DEA) to perform a condition assessment (Study) of the bridges along the Line. The findings of this Study are included and summarized in this report, to be submitted to the Port on September 29, 2008

Purpose and Need for Report

The objective of this report is to provide opinions of costs to bring the 107 bridges located along the Line (reference Attachment 4 for bridge location maps) to a condition that would allow the Line to reopen as well as anticipated short-term and anticipated long-term costs of the bridge system associated with owning and operating the Line

The Study is based upon a visual assessment of the bridges, quantification of repairs based on recommendations noted in bridge inspection reports completed by Osmose Railroad Services, Inc. (Osmose) in 2007, and development of an opinion of probable bridge system costs which a new owner may encounter. Three costs for each bridge have been evaluated—those anticipated to open the Line to traffic (immediate), those anticipated to occur over for the next 5 years (short-term), and those anticipated to occur beyond 5 years (long-term)

Existing Information

Rail Line Location and History

The following brief narrative is provided for the user of this report to understand, in context, the approximate age of the bridge structures studied and ownership since construction. The Line is approximately 111 miles long and located entirely in Oregon, while traversing portions of Coos, Douglas and Lane Counties.

The Southern Pacific Railroad (SPRR) opened the Line from Eugene to Marshfield (now know as Coos Bay) in 1916. The section of the Line from Eugene to Coos Bay is the proposed Coos Bay Rail Link. SPRR sold the Line on December 31, 1994 to CORP.

The existing bridge system was designed and constructed for a Cooper E-50 – E-60 design load This load carrying design capacity is ¾ of a new rail bridge designed today

Osmose Railroad Services, Inc. (Osmose) Bridge Inspection Reports

The Port provided to the Study Team the Bridge Inspection Reports completed by Osmose in 2005 and 2007. Due to the large size of these documents, only the 2007 reports are bound in this report for the Port as Attachment 1 and we understand that the 2007 and 2005 Osmose Reports were included in Volume III and IV respectively of Reply of the Oregon International Port of Coos Bay, filed September 12, 2008.

DEA has reviewed existing Bridge Inspection Reports completed by Osmose in 2007 and tabulated prioritized repairs noted in those reports, which were provided by the Port of Coos Bay

Study Organization and Methodology

The primary elements of the Study are

- Existing Osmose data collection and tabulation
- Bridge Inspections
- Development of opinions of cost for recommended repairs

Each of these Study activities is described below

Existing Osmose Data Collection and Tabulation

The 2005 and 2007 Osmose Bridge Inspection Reports summarized and prioritized recommended repair work for each bridge. This repair work was quantified from both of the inspection reports for each bridge. From this work, the Study Team was able to identify the repairs that were recommended in 2007 but not noted for 2005. Note that much of the work identified in the 2005 report as Priority 2 and 3 remains on the 2007 report as maintenance deferred. By examination of repair work completed in the 2007 Osmose reports, we estimate approximately less than 1% of the repairs recommended by Osmose in 2005 were completed by the time the 2007 Osmose inspections were conducted. We understand that in November 2007, CORP put forward a cost estimate for Phase I bridge repairs of \$6.75 million, which appears to be based on priority 2 repairs, and a cost estimate for Phase II bridge repairs of \$3.75 million, which appears to be based on priority 3 repairs. We have been told by the Port's counsel that no detail was provided for these estimates and that the back-up for these estimates was not provided to the Port in response to discovery served on CORP. As noted below, DEA has provided summary and detailed estimates for the repairs needed for these bridges by priority based upon 2009 dollars.

Bridge Inspections

The Study Team conducted visual inspections of the bridges (with the exception of Bridge No 716.40) on the Line from September 13th to September 18th Field reports for the 2008 DEA Visual Inspections are included in Attachment 2 of this report. In addition, the Study Team conducted an annual inspection of Bridge No 716.40 and this report is included as Attachment 5 of this report.

The following narrative has been included for an understanding of the level of review involved for three general categories of bridge inspection

- A visual inspection is the basic inspection and is conducted for observation review, no material tests are performed. The observations take place from the bridge deck and/or areas accessed by foot below. For this Study, visual inspections were conducted to review the Osmose routine Bridge Inspection Reports and to identify obvious additional damage which may have occurred since the Line was embargoed. In addition, this visual inspection was conducted to correlate the Study Team's understanding of the bridges' conditions and general state of maintenance with the repair recommendations contained in the Osmose report.
- 2 An annual or biannual routine inspection builds on the visual inspection and is generally the industry standard inspection for routine inspections. A structural member condition inventory is assembled for each structural element (beam, column, pile, cap etc.)
- A detailed inspection represents the next level of inspection and is generally conducted prior to a major bridge rehabilitation or in order to establish a safe load capacity. A detailed inspection includes the evaluation of each structural element for its condition, which is a more in-depth, time intensive inspection than a routine inspection and can include supplemental equipment to include ladders, mechanical lifts, and boats. A detailed inspection can include limited material testing, including limited boning of representative timber members to establish if any interior deterioration is occurring; and for steel, the actual steel thickness is measured to determine the remaining structural section. A structural member condition inventory is assembled for each structural element (beam, column, pile, cap etc.) This inspection includes a load capacity analysis based upon

the remaining structural section for each member. Calculations and a summary of the load capacity are submitted in a load rating report.

None of the inspection categories include underwater inspections unless scour or other problems are noted. Both the routine and detailed inspections include an itemization of repairs for each bridge. Our teams also prepared itemized repair recommendations and costs for all visually inspected bridges based upon the 2007 Osmose inspection report and any additional data gathered during the visual inspection of each bridge.

Cost Estimating

Osmose Bridge Repair Recommendations

The Osmose Bridge Inspection Reports prioritize recommended bridge repair work based on the following designations, which we have also used in our report:

Priority 1 – Emergency: Stop operation over the structure and perform repairs immediately. There are no Priority 1 repairs noted in the 2007 reports. The visual inspections by DEA did not find new Priority 1 repairs required for bridges, however, due to ship/bridge unreported accidents, scour associated with high flow events, debris collisions with bridge elements, etc. which may occur prior to opening the Line, we recommend the new rail operator conduct a visual track and bridge inspection immediately prior to opening the Line. Also, during our visual inspection, slides were noted along the rail Line that stop operations and would need to be cleared and stabilized prior to opening the Line.

Priority 2 – Condition is unsafe and could cause failure at any time: Repair as soon as possible Condition must be monitored continually until repairs have been completed Repairs classified as Priority 2 are recommended to be complete prior to opening the Line to rail traffic

Priority 3 - Condition could become unsafe and should be monitored frequently: Repair in the near future

Priority 4 - Condition is substandard and should be monitored. Condition may require repairs within one to five years

Priority 5 – Either no defects or only minor defects were found Repairs not recommended at this time, but condition of structure should be monitored

Rail Operation Considerations Influencing Bridge Costs

The following discussion relates to the costs to immediately open the bridge system to traffic, as well as short- and long-term bridge system costs and how they are influenced heavily by the intended operational plans for the Line If the use of the Line changes and additional capacity (heavier cars and faster speeds) is required, the cost to maintain and improve the Line increases. All costs noted in this section (Priority 2, 3, 4, Rehabilitation, Replacement, and Removal) are noted in Figures 1 and 2 located in the Summary of this report. More detailed calculations for these costs is contained in Attachment 3 of this report.

A railroad with limited freight, seeking to maintain the Line with minimal expenditures, will keep operating with the rail Line under the conditions which existed prior to the embargo, i.e. E-60 maximum loading, slow speeds less than 10 mph on bridges, all rail cars loaded to meet the E-60 loading capacity, and spacing of cars to avoid having maximum loaded cars adjacent to each other. The initial cost to get this bridge system up and running under the operating conditions in place prior to the embargo is the cost of the Priority 2 repairs. In addition, this railroad bridge system may cost approximately \$1,200,000 annually to correct new Priority 2 repairs identified during annual bridge inspections. However, there will also be unanticipated and indeterminate expenditures. This amount is influenced by the continued past practice of deferred maintenance (Priority 3 and 4), which delayed maintenance until they become a Priority 1 or 2. This is the primary assumption for development of costs to begin operations, as well as short-term and long-term bridge costs identified in this report. This is the assumption used by railroads to operate a line for profit, with limited revenue or freight. This method of management of a bridge



system can be maintained indefinitely. However, with this method, at some point in time, the continued deterioration of the system will yield unexpected and relatively large expenditures to correct nearly 100 years of deferred maintenance. When this time will arrive is not known. However, our opinion is that the largest expenditures will occur when currently designated Priority 3 and 4 repairs for the steel truss spans in the system (especially the Siuslaw and Umpqua River) are deemed by future bridge inspectors to be Priority 1 or 2. When this occurs, in order to maintain operations, the Port can expect large unplanned expenditures, which are impossible to fully quantify or schedule. We cannot determine if this point is 5, 10 or 50 years in the future. The only way to avoid unanticipated expenditures of a bridge system this age is to proactively invest in the bridges to arrest deterioration and restore the condition of the bridge system by reversing several decades of deferred maintenance.

A railroad with a plan to gradually incorporate improvements to upgrade the Line to E-80 standards, while maintaining current operations at the E-60 maximum, would slowly upgrade the bridge system with the average speed being 30 mph. The cars would still be loaded to meet the E-60 loading and require spacing of cars to avoid having cars hauling maximum loads adjacent to each other. The initial cost to get this operation up and running would include the Priority 2 and 3 repairs. This railroad will cost approximately \$750,000 per year to maintain and another \$1,750,000 per year for upgrades changing out structures on some sort of priority basis (probably matched to speed). This means current repairs are done to maintain the E-60 standards but portions of the Line would be upgraded to E-80 and higher speeds over a long period of time. This method of railroad operations will slowly begin reversing the deferred maintenance of the bridge system.

A railroad with an immediate need for increased capacity improvements to upgrade much of the bridge system to a higher standard now, meaning we would still operate with E-60 engines but could handle E 72 rail car loads (286,000 pound cars) on the bridges and tunnels while having a lower speed, the average could start around 25 mph. This bridge system would cost approximately \$70,000,000 to get up and running, the big change being heavier rail and ties on bridges. This would require a more detailed study of the bridges currently carrying the lighter loads to be assured that the current steel bridges could handle the higher loads. This bridge system will cost approximately \$500,000 per year to maintain and another \$1,500,000 per year for upgrades for approximately 15-20 years to finish the upgrade cycle.

Cost Estimating Methodology

Opinions for five primary costs (immediate cost to start operation, short-term (within 5 years), long-term (beyond 5 years), rehabilitation, and complete replacement costs) were developed for each bridge. Calculations for each of these costs are contained in Attachment 3 of this report. In addition, the estimated cost to remove all of the bridges has been calculated. These costs have been summarized in Figures No. 1 and No. 2 of this report.

The basis of cost was developed by quantifying the repair recommendations and applying unit costs for each repair. In addition, these costs include an allowance for design and construction engineering. All costs assume a competitive bid for the work by qualified general contractors in the spring of 2009. It should be noted that during repair of items recommended in the report, typically other damaged members that may have been hidden are found, thereby increasing the amount of the work from that shown in the report. Consistent with industry standard, a construction contingency has been added to all costs to account for this unidentified work. All costs in this report are assumed to be 2009 dollars. Future budgetary numbers should be increased for inflation accordingly.

The 2005 and 2007 Osmose Bridge Inspection Reports summarized and prioritized recommended repair work for each bridge. This repair work was quantified from both inspection reports for each bridge. From this work, the Study Team was able to identify the repairs that were recommended in 2007 but not noted for 2005. This difference is assumed to represent the incremental deterioration of the Line over a two year span. Our visual inspections took place during September 2008 and our understanding is the transfer of ownership for the Line is projected for March 2009. Therefore, there will be six months of additional deterioration of the Line beyond the condition observed by our inspectors in September 2008. The Study Team did consider that a lack of traffic on the

Line, from September 2007 to spring 2009, would generally be favorable for decreased deterioration of the bridge system during this time. However, the traffic on the Line from 2005 to 2007 is considered light and the deterioration of materials accelerate as they age. Therefore, these two factors were considered to cancel each other and the base cost of immediate and short-term repairs were increased an amount equal to the difference in recommended repairs and their associated costs from 2005 to 2007 prorated for six months. This increase is intended to account for six months of deterioration of the bridge system in the Pacific Northwest climate from the date of our visual inspection in September 2008 to March of 2009. This increase has been calculated to consist of an additional \$40,775 of Priority 2 repairs, \$81,100 of Priority 3 repairs, and \$442,575 of Priority 4 repairs.

Another consideration is that while the system is not operating, many repairs can be accomplished more efficiently or cost-effectively and there may be some advantages to accomplishing Priority 3 and 4 repairs at this time. Another factor is that aggregating items together to produce large volume contracts can reduce unit prices. For instance, removing a stringer while doing track and tic upgrade projects is much easier and should be accomplished at the same time. These types of considerations have not been included in the Study at this time, as the methodology of the capital improvement program for this Line has not been established.

Cost of bridge system administration is not included in this Study However, this bridge system should be inspected yearly or biennially. This annual cost (identified by Osmose) is approximately \$50,000 00 dollars per year (2009 cost)

Immediate Bridge Costs to Begin Operations

The basis of the immediate bridge repair costs were developed assuming the Line will have limited freight in the first 5 years with corresponding minimal expenditures for maintenance. The following considerations determined our estimated cost to begin bridge system operations.

- We quantified Priority 2 repairs recommended in the 2007 Osmose reports and applied unit costs for each repair
- We quantified repairs identified during the 2008 DEA visual inspections and applied unit costs for each repair
- We have increased the value of the Priority 2 repairs by \$40,775 to reflect additional deterioration of the bridge system, which will occur from September 2008 to March 2009
- One year cost to reestablish an annual inspection program is \$50,000
- Our routine inspection of Bridge 716 40 (Siuslaw) recommends a load rating be performed on the steel truss spans of this bridge prior to start of operations. We have assumed this recommendation would hold true for Bridge 739 68 (Umpqua) Cost for each analysis is \$50,000 resulting in a total cost of \$100,000.

Cost calculations for typical and unique repairs by bridge are included in Attachment 3

The total cost of Osmose and DEA identified Priority 2 repairs is \$9,211,395, coupled with the \$40,775 of additional repairs anticipated for deterioration, which will occur prior to transfer of Line ownership, \$50,000 for inspection, \$100,000 for load ratings of Bridge Numbers 716 4 and 739 68 yields a total bridge system cost to begin operations of \$9,402,170

Anticipated Short-Term Bridge Costs (Years 2, 3, 4, 5)

The basis of the short-term bridge operating cost was developed by addition of the following considerations

- We assigned a \$1,200,000 (2009 dollars) per year for a bridge maintenance budget assuming the Line would be operated to minimize expenditures
- We allowed for \$50,000 per year inspection budget.

The total short-term (four total years) costs assuming the Line is managed to minimize expenditures is \$5,000,000

Note The short-term bridge costs can be exceeded if Priority 3 and 4 repairs are down-graded to Priority 1 or 2 A conservative upward boundary for short-term costs may be the magnitude of the Priority 3 repairs or \$15,000,000 This amount is approximately equal to the risk of operating the system, while minimizing expenditures

Anticipated Long-Term Bridge Costs (Beyond 5 Years from Start of Operation)

The basis of the short-term bridge operating cost was developed by addition of the following considerations

- We assigned a \$1,200,000 (2009 dollars) per year for a bridge maintenance budget assuming the Line would be operated to minimize expenditures
- We allowed for \$50,000 per year inspection budget.

The long-term costs, assuming the Line is managed to minimize expenditures, is \$1,250,000 per year (2009 dollars).

Note The long-term bridge costs can be exceeded if Priority 3 and 4 repairs are down-graded to Priority 1 or 2. A conservative upward boundary for long-term costs may be the magnitude of the Priority 3 and 4 repairs or \$30,000,000 This amount is approximately equal to the risk of operating the system, while minimizing expenditures

Rehabilitation of Bridge System

Another reasonable assumption for the long-term bridge costs for a bridge system of this age could be assumed to be the cost to rehabilitate and upgrade the entire bridge system with an increase in capacity and service life. This cost is estimated to be approximately \$119,000,000. This rehabilitation would indefinitely restore the bridge system for the foreseeable future and reduce or eliminate unplanned expenditures on the Line, as well as reduce or eliminate unplanned loss of service resulting from the discovery of new Priority 1 or 2 repairs. These bridge costs are a planning level estimate based upon a competitive bid of the work by qualified contractors. Rehabilitation cost calculations are noted in Attachment 3.

Replacement Value of Bridge System

The cost to construct this bridge system should the Line need to be reestablished in the future is \$400,000,000. This cost is for the bridges only and does not include costs associated with reestablishing the track, ballast, general grading, signals, communication systems, signage, and right of way. This cost is presented in 2009 dollars, which will need to be increased for anticipated year of construction. These costs are a planning level estimate based upon a competitive bid of the work by qualified contractors. In addition, these costs have been increased to provide an allowance for design and construction engineering, as well as a contingency to account for conceptual understanding of the replacement requirements. Replacement calculations are noted in Attachment 3.

Removal Cost of Bridge System

Nearly all materials in the existing bridge system are hazardous waste and consist primarily of creosote treated timbers or have lead based paint on the steel. The cost to remove and dispose of this bridge system (including contractor mobilization and contingencies) is estimated to be \$31,840,725. This cost does not include the cost of permitting the removal of these bridges, which primarily exist in waterways influencing endangered species. As discussed in the Reply Verified Statement of Dana Siegfried of DEA filed by the Port on September 12, because

work will need to occur during the approved in-water work windows for these sites, costs for labor during these times will be at a premium. In addition, our experience relating to the demolition of a large steel truss over an environmentally sensitive waterway results in our opinion that any bridge removal in Oregon will require work to be isolated from waters, i.e. coffer dams, and each truss span will be required to be fully coated (to contain lead), picked up as one piece, moved off site and out of waters or wetlands, and then dismantled and disposed of the lead coated members in a legal manner, followed by removal of the concrete foundations. Our removal costs incorporate these factors but do not include removal costs of several generations of treated timber ties and other materials, which have been routinely discarded along the Line over the years. Removal cost calculations are included as a part of the replacement calculations noted above and are included in Attachment 3.

Summary

Priority 2-3-4, rehabilitation, replacement, and removal costs for the bridge system are summarized by bridge in Figures No 1 and 2. All costs are calculated for 2009 construction. There is no additional allowance for inflation due to construction in subsequent years.

Rehabilitation expenditures will reduce the Port's exposure to unplanned expenditures, interruptions of service, as well as increase the systems' capacity

Abbreviations used in Figures 1 and 2 below

AR	Arch	PCI	Prestressed concrete "I" beam
BD	Ballast deck trestle	PCB	Prestressed concrete box
BM .	Beam span	PCS	Prestressed concrete slab
CTG	Concrete "T" girder	RCS	Reinforced concrete slab
CB	Concrete box	IB	Steel "I" beam
CBG	Concrete box girder	SBS	Steel beam span
CS	Concrete slab	SPT	Steel pile trestle
DPT	Deck pinned truss	TPCT	Thru pinned connected truss
DPG	Deck plate girder	TPT	Thru pinned truss
DPLG	Deck plate lattice girder	TPG	Thru plate girder
DRT	Deck riveted truss	TRT	Thru riveted truss
FT	Frame trestle-all timber	WFB	Wide flange beam
OD	Open deck	WFBS	Wide flange beam span
PT	Pile trestle-all timber	WSP	Wide steel beam

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652.21	120 ft OD PT	1940	Amazon creek	\$161,760	\$2,400	\$39,200	\$396,000	\$859,815
652.58	8 # OD PT		Drainage	0\$	\$12,800	0\$	0\$	\$57,321
656.12	100 ft OD TRT	1912	Coyote Creek	0\$	\$14,875	\$59,500	\$907,500	\$3,403,125
657.12	120 ft OD PT	1941	Coyote Creek	\$12,800	\$25,760	: \$32,960	\$396,000	\$859,815
657.96	30 ft BD PT	1927	Coyote Creek	0\$	0\$	\$29,120	000'66\$	\$214,954
658.17	120 ft OD SPT	1923	Water	\$46,240	\$16,640	\$17,120	\$594,000	\$948,915
68 099	90 ft OD PT	1943	Drainage	\$12,800	\$16,320	\$26,080	\$297,000	\$644,861
661.28	90 ft OD PT, 63 ft OD TPG, 90 ft OD PT	1932, 1914, & 1932	Long Tom Creek	\$12,800	\$102,880	\$105,280	\$1,009,800	\$2,448,245
661.73	135 ft OD PT	1934	Long Tom Overflow	0\$	\$27,200	\$52,640	\$445,500	\$967,292
662.59	345 ft OD PT	1936	Long Tom Overflow	\$52,000	\$120,320	\$87,360	\$1,138,500	\$2,471,968
664.00	100 ft OD TRT, 135 ft BD PT	1914 & 1926	Long Tom Creek	\$56,000	\$216,125	\$5,250	\$1,397,550	\$4,616,884
664.62	90 ft OD PT, 100 ft OD TRT, 90 ft OD PT	1939, 1914, & 1939	Long Tom Creek	\$14,000	\$88,900	\$76,650	\$1,560,900	\$4,971,557
664.85	75 ft OD PT, 100 ft OD TRT, 75 ft OD PT	1939, 1914, & 1939	Long Tom Creek	\$35,000	\$118,125	\$30,800	\$1,452,000	\$4,735,108
665 49	105 ft OD PT, 100 ft OD TRT, 90 ft OD PT	1933, 1914, & 1933	Eik Creek	\$15,750	\$45,500	\$23,975	\$1,615,350	\$5,089,782
666.21	60 ft BD PT	1930	over Rd.	\$1,600	0\$	\$16,000	\$198,000	\$443,891
667.28	75 ft OD PT	1928	Drainage	0\$	\$22,400	\$20,160	\$247,500	\$537,384
667.40	90 ft OD PT, 160 ft OD DPG, 45 ft OD PT	1933, 1914, & 1934	Noti Creek and Vaughm Rd	\$427,200	\$107,200	\$70,720	\$1,501,500	\$2,232,512
668.50	154 ft OD PT, 120 ft OD DPG, 90 ft OD PT	1933, 1944, & 1921	Noti Creek	\$104,160	\$55,040	\$54,880	\$1,597,200	\$2,779,788
621.89	90 ft OD PT	1943	over RD	0\$	\$29,920	\$67,840	\$297,000	\$665,837
674.03	30 ft OD PT	1956	Stream	\$22,720	\$320	\$18,560	\$99,000	\$214,954
676.23	60 ft OD DPG	1913	Chikkahominy Creek	\$32,640	\$11,200	0\$	\$396,000	\$1,054,350
677.05	60 ft OD SPT	1914	Walker Creek	\$2,400	\$45,120	,\$16,320	\$297,000	\$474,458
677.80	56 ROD PT, 80 ROD TPG, 45 ROD PT	1932, 1914, & 1951	Wild Cat Creek	\$0	\$55,840	\$29,120	\$861,300	\$2,194,818
678 43	75 ft OD PT, 122 ft OD TPG, 45 ft OD PT	1921, 1914, & 1927	Wild Cat Creek	\$8,000	\$193,600	\$53,280	\$1,201,200	\$3,103,304
680.17	150 ft OD TRT	1914	Wild Cat Creek	\$0	\$71,050	. \$24,500	\$1,361,250	\$5,817,075
680.46	102 ft OD TPG	1914	Wild Cat Creek	\$80,000	\$326,400	\$2,400	\$673,200	\$2,903,175
680 77	102 ft OD TPG	1914	Wild Cat Creek	\$40,000	\$42,080	\$0	\$673,200	\$2,903,175

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(LOCATION				TOTAL	TOTAL	TOTAL	TOTAL	TOWN
681.05	162 ft OD TPG	1914	Wild Cat Creek	\$83,200	\$6,400	\$82,400	\$1,069,200	\$2,979,059
681 45	222 ft OD DPG	1914	Wild Cat Creek	\$104,800	\$160,800	\$2,400	\$1,465,200	\$4,082,414
682.18	200 ft OD TPG, 50 ft OD DPG	1814	Siuslaw River	\$88,000	\$148,800	\$116,000	\$1,650,000	\$6,360,131
683.36	155 ft OD TPG, 200 ft OD TRT, 120 ft OD TPG	1914	Siusiaw River	\$98,175	\$20,125	\$10,150	\$3,811,500	\$15,945,909
687.03	65 ft OD PT	1922	Rock Creek	\$0	\$63,680	\$32,320	\$214,500	\$465,733
687.88	90 ft OD PT	1922	Meadow Creek	\$12,160	\$45,920	\$25,760	\$297,000	\$644,861
689.23	15 ft BD PT	1926	Creek	\$640	000'8\$	\$3,200	0\$	\$102,713
690.47	45 ft OD TPG	1914	San Antonio Creek	\$22,560	\$2,400	0\$	\$297,000	\$341,550
690.85	64 # OD TPG, 114 # OD TRT, 108 # OD TPG	1914	Siuslaw River	\$29,400	\$39,025	\$220,850	\$2,283,270	\$8,124,612
691.05	70 ft OD DPG, 250 ft OD TRT, 135 ft OD PT	1914 & 1934	Siusiaw River	\$259,875	\$279,125	\$476,000	\$3,267,000	\$11,970,356
691.38	5 ft OD FT	1914	Creek	\$8,000	\$12,800	096\$	\$0	\$102,713
692 06	16 ft BD PT		Creek	\$32,000	\$0	\$12,800	\$0	\$109,560
693.27	75 ft BD PT	1928	Creek	\$640	\$21,760	\$12,960	\$247,500	\$537,384
694.32	150 ft OD PT, 200 ft OD TPT, 90 ft OD PT	1936, 1914, & 1925	Siuslaw River	\$458,850	\$344,050	\$126,175	\$2,686,200	\$9,886,68
694.78	90 ft OD DPG, 150 ft OD TRT, 90 ft OD DPG	1914	Siuslaw River	\$216,300	\$304,938	\$810,250	\$2,668,050	\$9,296,430
694.98	15 nod FT	1914	Creek	\$ 0	\$20,160	\$0	\$0	\$102,713
696.66	75 ft BD FT, 150 ft OD TRT, 135 ft OD PT	1914, 1914, & 1921	Lake Creek	\$3,325	\$62,300	\$154,175	\$2,123,550	\$7,696,825
700.37	120 ft OD PT	1939	Thompson Creek	\$10,400	\$76,480	\$26,560	\$396,000	\$859,815
702.65	135 ft OD PT	1938	Creek	\$37,600	\$13,600	\$17,280	\$445,500	\$967,292
702.95	60 ft OD PT	1946	Creek	\$22,720	\$22,400	\$0	\$198,000	\$429,908
710.20	105 ft BD PT	1925	Olsen Creek	\$35,520	\$14,400	\$30,880	\$346,500	\$752,338
711.37	75 ft BD PT	1928	Creek	\$19,040	\$800	\$30,080	\$247,500	\$537,384
711.67	75 ft BD PT	1931	Creek	\$24,000	\$27,200	\$34,400	\$247,500	\$537,384
712.16	60 ft BD PT	1926	Creek	\$8,000	\$20,160	\$42,720	\$198,000	\$429,908
712.80	60 ft OD PT	1927	Creek and Access Rd	\$34,400	\$20,160	\$19,200	\$198,000	\$429,908
716.40	4 ROD TPG, 2670 ROD PT, 400 ROD TPT, 284 ROD TR	1933, 1933, 1915, & 1931	Siuslaw river	\$2,462,040	\$2,408,175	\$884,450	\$16,327,740	\$69,877,691
71812	30 ft BD CB	1975	slough	\$8,000	\$0	\$12,800	\$0	\$
719.07	105 ft OD PT	1932	Creek and Private Access	\$64,320	\$63,360	\$26,560	\$346,500	\$752,338
719.21	315 ft OD PT	1939	Private Access and Marsh	\$154,240	\$117,760	\$98,240	\$1,039,500	\$2,257,014
724.22	120 ft BD CB	1970	Maple Creek	\$8,000	\$12,800	\$0	0\$	\$0
725.96	646 ft OD PT	1975	Lake Siltcoos	\$61,120	\$29,440	\$17,600	\$2,131,800	\$4,628,671

		Gees Bery Rei	Good Bey Reil Link Britis Good Summery) Ferme	No. 1			
	Section Control of the			F 23	REMORAL GOSTES	ত্র	ELEGE TRAIGH THRREEMS	MYL GOSTES
1000								
LOSAMON	STRUCTURE DESCRIPTION	YEAR BUILT	SPANS OVER	FRICKIN/2	FRICHM 8 Torm	FRICTIN 4	REKABILITAATION Tastan	REPLACEMENT
756 34	900 # OD PT	1973	I ske Sittone	\$481 440	\$425 420	\$250,800	C3 267 000	7 TO 3 474
727.35	(200 ft BD CB	1977	Lake Siftcoos	\$7.040	\$800	95	80	0\$
728.51	270 ft OD PT	1930	Lake Siltcoos	\$96,320	\$177,280	\$57,120	\$891,000	\$1,934,584
729.04	390 ft OD PT	1932	Wetland	\$198,080	\$132,320	\$166,560	\$1,287,000	\$2,784,399
729.17	480 ft BD CB	1981	Lake Tahkenitch	\$7,360	\$12,800	\$0	\$0	\$0
730.56	990 ft OD PT, 120 ft OD CB, 102 ft OD DPG	1953, 1915, & Steel 1915	Lake Tahkenitch	\$96,000	\$449,920	\$376,960	\$4,534,200	\$17,798,839
731.65	945 ft OD PT, 102 ft OD DPG, 1245 ft OD PT	1960, 1918, & 1915	Lake Tahkenitch	\$49,280	\$1,082,560	\$776,000	\$7,900,200	\$17,567,327
732.84	375 ft OD PT, 28 ft OD DPG, 228 ft OD PT	1915, 1915, & 1944	Lake Tahkenitch	\$30,720	\$252,960	\$219,520	\$2,174,700	\$4,541,984
733.88	1120 ft BD CB	1980	Lake Tahkenitch	0\$	\$12,800	0\$	\$0	\$0
733.95	1178 ft BD CB	1980	Lake Tahkentich	\$6,400	\$21,200	\$0	\$0	0\$
735.86	80 ft OD PT	1931	Wetland	\$57,920	\$27,200	\$49,280	\$264,000	\$573,210
736 03	50 ft OD PT	1926	Jack Frank creek	\$27,520	\$41,600	\$17,600	\$165,000	\$358,256
736.51	48 ft OD PT	1926	Grade Separation	0\$	\$28,160	\$39,520	\$158,400	\$314,820
737.33	90 ft BD PT	1931	Jack Franz Creek	0\$	\$0	\$43,040	\$297,000	\$644,861
738 70	30 ft OD PT	1927	Grade Separation	\$58,400	\$36,640	\$32,960	000'66\$	\$196,763
738.94	405 ft OD PT	1915	Smrth River slough	\$3,840	\$97,440	\$83,200	\$1,336,500	\$2,901,876
739.14	375 ft OD PT, 50 ft OD TPG, 165 ft OD PT	1937, 1915, & 1915	Smith River slough	\$154,400	\$396,960	\$132,800	\$2,112,000	\$4,264,549
739.43	288 ft OD PT, 92 ft OD TPG, 119 ft OD PT	1915	Smith River slough	\$61,120	\$145,600	\$141,600	\$1,950,300	\$4,608,017
739.68	80 11 OD PT, 1125 11 OD TPT, 360 11 OD TPT, 60 11 OD PT	1915	Umpqua River	\$1,698,200	\$4,922,750	\$5,524,400	\$13,984,575	\$85,714,419
740.25	60 ft OD PT	1914	over Rd	\$16,000	\$3,200	\$31,200	\$198,000	\$443,891
740.84	60 ft OD PT	1980	Scofield creek	\$2,400	\$12,800	\$	\$198,000	\$443,891
741.35	60 ft OD PT	1915	Creek	\$7,360	\$34,720	\$33,760	\$198,000	\$429,908
741.74	45 ft OD PT	1915	Creek	\$23,680	\$37,120	\$31,360	\$148,500	\$322,431
742 05	45 ft OD PT	1915	Creek - Wetland	9	\$65,120	\$8,000	\$148,500	\$322,431
742.24	120 ft OD PT	1928	Creek - Wetland	0\$	\$14,400	\$64,960	\$396,000	\$859,815
742.72	135 ft OD PT	1915	Scoffeld creek	\$0	\$21,120	\$89,120	\$445,500	\$967,292
742 95	60 ft OD PT	1936	Creek	\$0	\$65,760	\$18,560	\$198,000	\$429,908
743.20	45 ft BD PT	1929	Grade Separation	\$0	\$36,160	\$10,400	\$148,500	\$295,144
743.73	135 ft OD PT	1934	Scoffeld creek	\$238,400	\$54,560	\$50,240	\$445,500	\$967,292
743.88	120 ft OD PT	1934	Scoffeld creek	\$12,800	\$91,200	\$42,080	\$396,000	\$859,815
743.97	105 ft OD PT	1932	Scoffeld creek	\$8,240	\$94,720	\$77,760	\$346,500	\$752,338

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	EXISTINGIBRIDGE			DEG OFFI	REVIOUS WENT GOSTIE	මනැල	WEXTH TOTAL COSTS	UL COSTS
BRIDGE	STRUCTURE DESCRIPTION	YEAR BUILT	SPANS OVER	FRIGHTY 2	मित्रविद्योग्रि १	म्यान्याग्र ८	MENTALITANION	REPLYBENTER
LOCATION				TOTAL	TOTAL	TOTAL	TIOTAL	TIOTAL
744.24	75 ft BD PT	1929	Wind creek	\$400	\$10,560	\$24,800	\$247,500	\$537,384
744.44	75 ft BD PT	1929	Wind creek	0\$	\$7,200	\$3,200	\$247,500	\$537,384
744.70	75 ft BD PT	1929	Wind creek	0\$	\$3,200	\$25,760	\$247,500	\$537,384
744.83	75 ft BD PT	1929	Wind creek	0\$	0\$	\$13,600	\$247,500	\$537,384
748.06	90 ft BD PT	1931	Small Creek	\$14,720	0\$	0\$	\$297,000	\$644,861
748.44	30 ft BD PT	1929	Small Creek	0\$	0\$	\$24,800	000'66\$	\$214,954
748.68	75 ft OD FT	1915	Small Creek	\$89,760	\$26,400	089'68\$	\$247,500	\$537,384
749.89	930 ft BD CB	1978	Black Lake	\$7,040	\$12,800	0\$	0\$	\$0
750.46	960 ft OD PT, 60 ft OD SBS, 513 ft OD PT	1930, 1915, & 1930	North Lake	009'62\$	\$139,200	\$8,160	\$5,256,900	\$11,657,584
751.02	320 ft OD PT	1915	North Lake	\$32,000	\$25,600	\$28,320	\$1,056,000	\$2,292,840
752.99	180 ft OD PT	1932	Ten Mile creek	0\$	\$16,000	\$35,200	\$594,000	\$1,289,723
753.48	105 ft OD PT	1932	Grade Separation	\$12,800	\$5,440	\$20,400	\$346,500	\$688,669
753.97	41 ft OD SBS	1929	over hwy	\$800	0\$	\$10,400	\$270,600	\$311,782
755.63	75 ft OD PT	1940	Clear Lake	\$8,160	\$12,800	\$33,920	\$247,500	\$537,384
756.13	75 n OD FT	1915	Saunders Lake	\$20,000	\$16,000	\$3,200	\$247,500	\$537,384
756.55	75 ft OD PT		Saunders Lake	\$64,000	\$59,200	\$42,240	\$247,500	\$537,384
757.37	75 ft OD PT	1915	Butterfield Lake	\$57,120	\$13,600	\$20,160	\$247,500	\$537,384
761.13	45 ft OD SPT	1912	Tidal Creek	\$26,880	\$61,760	\$8,160	\$222,750	\$355,843
			PRIORITY SUBTOTAL	(3)241,336	[846,089,708	SUSTON (SUS	[8146,978,036]	1935/W/1909/
		\$	Estimated Increased Repair Costs for 6 Months of Additional Deterioration to Projected Ownership Transfer March 2009	94463	994,400	877.29.5TG		

Coos Bay Rail Link Bridge Condition Assessment Final Report

	Coos Bay Rail Link Bridge Removal Cost Summary	emoval Cost Sum	mary Figure No. 2	
				OVERALL REMOVAL
•	EXISTING BRIDGE			COSTS
BRIDGE	STRUCTURE DESCRIPTION	YEAR BUILT	SPANS OVER	TOTAL
LOCATION				
652 21	120 ft OD PT	1940	Amazon creek	\$36,000
652 58	B it OD PT		Dramage	\$2,400
656.12	100 & OD TRT	1912	Coyote Creek	\$125,000
657 12	120 ft OD PT	1961	Coyota Creek	000'96\$
96 / 29	30 ft BD PT	1927	Coyote Creek	000'6\$
658 17	120 ft OD SPT	1923	Water	000'06\$
680 689	90 ft OD PT	C>61	Drainage	\$27,000
661 28	90 RODPT, 63 ROD TPG, 90 RODPT	1932, 1914, & 1932	Long Tom Creek	\$101,250
661 73	135 ft OD PT	1834	Long Tom Overflow	\$40,500
662 59	345 ft OD PT	1936	Long Tom Overflow	\$103,500
664 00	100 R OD TRT, 135 R BD PT	1914 & 1926	Long Tom Creek	\$165,500
664 62	90 & OD PT, 100 & OD TRT, 90 & OD PT	1939, 1914, & 1939	Long Tom Creek	\$179,000
664.85	75 n OD PT, 100 n OD TRT, 75 n OD PT	1939, 1914, & 1939	Long Tom Creek	\$170,000
665 49	105 ft OD PT, 100 ft OD TRT, 90 ft OD PT	1933, 1914, & 1933	Elk Creek	\$183,500
686 21	60 ft BD PT	1930	over Rd	\$37,500
667 28	75 ft OD PT	1928	Drainage	\$22,500
667 40	DPG.	1933, 1914, & 1934	Noti Creek and Vaughn Rd	\$160,500
05 899	154 it OD PT, 120 it OD DPG, 90 it OD PT	1933, 1944, & 1921	Noti Creek	\$213,250
621 89	90 ft OD PT	1943	over RD	\$56,250
67403	30 ft OD PT	1956	Stream	000'8\$
676 23	60 ft OD DPG	1913	Childrahominy Creek	\$45,000
677 05	60 ft OD SPT	1914	Walker Creek	\$45,000
677 80	<u>P</u>	1932, 1914, & 1951	Wild Cat Creek	\$90,300
678 43	75 ft OD PT, 122 ft OD TPG, 45 ft OD PT	1921, 1914, & 1927	Wild Cat Creek	\$127,500
680 17	150 ft OD TRT	1914	Wild Cat Creek	\$630,000
680 46	102 ft OD TPG	1914	Wild Cat Creek	\$76,500
680 77	102 ft OD TPG	1914	Wild Cat Creek	\$76,500

Coos Bay Rail Link Bridge Condition Assessment Final Report

	Coos Bay Rail Link Bridge Removal Cost Summary	emoval Cost Sum	mary Figure No. 2	
				OVERALL REMOVAL
	EXISTING BRIDGE			COSTS
BRIDGE	STRUCTURE DESCRIPTION	YEAR BUILT	SPANS OVER	TOTAL
LOCATION				-212
881 05	162 ft OD TPG	1914	Wild Cat Creek	\$121,500
681 45	222 ft OD DPG	1914	Wild Cat Creek	\$166,500
682 18	200 ft OD TPG, 50 ft OD DPG	1914	Süstaw River	\$187,500
683.36	155 N OD TPG, 200 N OD TRT, 120 N OD TPG	1914	Siustaw River	\$456,250
687 03	65 ft OD PT	ZZ81	Rock Creek	\$19,500
687 88	50 ft OD PT	1922	Meadow Creek	\$27,000
689 23	15 R BD PT	1826	Creek	\$4,500
690 47	45 ft OD TPG	1914	San Antonio Creek	\$33,750
690 85	64 R OD TPG, 114 R OD TRT, 108 R OD TPG	1914	Sustaw River	\$271,500
691 05	70 R OD DPG, 250 R OD TRT, 135 R OD PT	1914 & 1934	Suistaw River	\$405,500
691 38	15 ft 00 FT	1914	Creek	\$4,500
692.06	16 ft BD PT		Craek	\$4,800
683 27	75 ft 80 PT	1926	Creek	\$22,500
694.32	150 £ OD PT, 200 £ OD TPT, 90 £ OD PT	1936, 1914, & 1925	Saistaw River	\$912,000
694 78	90 it OD DPG, 150 it OD TRT, 90 it OD DPG	1914	Suislaw River	\$765,000
694 98	15 ft OD FT	1914	Creek	\$4,500
99 969	75 R BD FT, 150 R OD TRT, 135 R OD PT	1914, 1914, & 1921	Lake Creek	\$693,000
700 37	120 ft OD PT	1939	Thompson Creek	\$36,000
702.65	135 ft OD PT	1938	Creek	\$40,500
702 95	60 ft OD PT	1946	Creek	\$18,000
710 20	105 ft BD PT	1925	Olsen Creek	\$31,500
711 37	75 ft BD PT	1928	Creek	\$22,500
711 67	75 ft BD PT	1931	Creek	\$22,500
712 16	60 ft BO PT	1928	Creek	\$18,000
712 80	60 ft OD PT	1927	Creek and Access Rd	\$18,000
716 40	54 R OD TPG, 2870 R OD PT, 400 R OD TPT, 284 R OD TRT	1933, 1933, 1915, & 1931	Siuslaw river	\$3,714,300
718 12	30 ft BD CB	1975	slough	S
719 07	105 ft OD PT	1932	Creek and Private Access	\$31,500
719 21	315 ft OD PT	1939	Private Access and Marsh	\$94,500
724.22	120 ft BD CB	1970	Maple Creek	SS
725.98	646 tt OD PT	1975	Lake Siffcoos	\$183,800

Coos Bay Rail Link Bridge Condition Assessment Final Report

	Coos Bay Rail Link Bridge Removal Cost Summary	emoval Cost Sum	mary Figure No. 2	
				OVERALL REMOVAL
	EXISTING BRIDGE			COSTS
BRIDGE	STRUCTURE DESCRIPTION	YEAR BUILT	SPANS OVER	TOTAL
LOCATION				2
728 31	990 ft OD PT	1973	Lake Sitcoos	\$297,000
727 35	1200 ft BD CB	1261	Lake Sutcoos	05
728.51	270 ft OD PT	1930	Lake Sutcoos	\$81,000
729.04	390 ft OD PT	1832	Wetland	\$117,000
729.17	480 ft BD CB	1981	Lake Tahkendch	0\$
730 58	990 f OD PT, 120 f OD CB, 102 f OD DPG	1953, 1915, & Steel 1915	Lake Tahkenitch	\$409,500
731 65	945 ft OD PT, 102 ft OD DPG, 1245 ft OD PT	1960, 1918, & 1915	Lake Tahkentch	\$733,500
732 84	375 ft OD PT, 28 ft OD DPG, 228 ft OD PT	1915, 1915, & 1944	Lake Tahkenitch	\$201,900
733 88	1120 ft BD CB	1980	Lake Tahkentch	05
733 95	1178 ft BD CB	1980	Lake Tahkentich	0\$
735 86	80 n OD PT	1831	Wettand	\$24,000
736 03	50 ft OD PT	1926	Jack Frank creek	\$15,000
736 51	48 n OD PT	1926	Grade Separation	\$14,400
737 33	90 ft BD PT	1831	Jack Franz Creek	\$27,000
738 70	30 ft OD PT	1927	Grade Separation	000'8\$
738 94		1915	Smith River slough	\$121,500
739 14	375 R OD PT, 50 R OD TPG, 165 R OD PT	1937, 1915, & 1915	Smith River slough	\$189,500
739 43	288 ft OD PT, 92 ft OD TPG, 119 ft OD PT	1915	Smith River slough	\$191,100
739 68	80 ROD PT, 1125 ROD TPT, 360 ROD TPT, 60 ROD PT	1915	Umpqua River	\$6,279,000
740.25	60 ft OD PT	1914	over Rd	\$37,500
740 84	60 ft OD PT	1980	Scoffeld creek	\$37,500
741 35	60 R OD PT	1915	Creek	\$18,000
74174	45 ft 00 PT	1915	Creek	\$13,500
742.05	45 ft OD PT	1915	Creek - Wetland	\$13,500
742 24	120 ft OD PT	1926	Creek - Wettand	\$36,000
7227	135 ft OD PT	1915	Scoffeld creek	\$40,500
742 95	60 ft OD PT	1936	Creek	\$18,000
743 20	45 ft BD PT	1929	Grade Separation	\$13,500
743 73	135 ft OD PT	1834	Scofield creek	\$40,500
743 88	120 ft OD PT	1934	Scoffeld creek	\$36,000
743 97	105 ft OD PT	1932	Scofield creek	\$31,500

Coos Bay Rail Link Bridge Condition Assessment Final Report

BRIDGE LOCATION

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	Coos Bay Rail Link Bridge	ail Link Bridge Removal Cost Summary	mary Figure No. 2	
PESCRIPTION YEAR BUILT SPANS OVER				OVERALL REMOVAL
1829 Wind creek 1829 Small Creek 1820 1915 Small Creek 1915 1915 Small Creek 1915 1915 Small Creek 1915	EXISTING BRIDGE			COSTS
1929 Wind creek 1929 Wind creek 1929 Wind creek 1929 Wind creek 1929 Small Creek 1915 Small Creek 1918 Black Lake 1915 Ten Me creek 1922 Grade Separation 1922 Grade Separation 1922 Grade Separation 1923 Grade Separation 1925 Grade Separation 1925 Grade Separation 1925 Grade Separation 1925 Grade Separation 1920 Over Lake 1915 Saunders Lake 1917 Cheek COVER WATER OVER ROADWAY OVER LAND SUBTOTAL 10% MOBILIZATION 40% CONSTRUCTION CONTINGENCIES		YEAR BUILT	SPANS OVER	TOTAL
1929 Wind creek 1931 Small Creek 1915 Town Lake 1920 I922 Grade Separation 1920 Over Into Creek 1915 Saunders Lake 1915 Saunders La				10181
1929 Wind creek 1929 Wind creek 1929 Wind creek 1929 Wind creek 1929 Small Creek 1915 Small Creek 1922 Over thay 1940 Cleer Lake 1915 Saunders Lake OVER WATER OVER ROADWAY OVER LAND SUBTOTAL MANUAL M	75 ft BD PT	1929	Wand creek	\$22,500
1929 Wind creek 1931 Small Creek 1932 Small Creek 1935 Small Creek 1915 Small Creek 1920 North Lake 1922 Grade Separation 1929 Over flay 1940 Clear Lake 1915 Saunders Lake 1915 Sunders Lake 1916 Sunders Lake 1917 Sunders Lake 1918 Sunders Lake 1918 Sunders Lake 1918 Sunders Lake 1919 Sunders Lake 1910 Sunders Lake 1910 Sunders Lake 1911 Sunders Lake 1912 Sunders Lake 1913 Sunders Lake 1914 Sunders Lake 1915 Sunders Lake 1916 Sunders Lake 1917 Sunders Lake 1918 Sunders Lake 1919 Sunders Lake 1910 Sunder	75 ft BD PT	1929	Wind creek	\$22,500
1929 Wind creek 1931 Small Creek 1915 S	75 & BD PT	1929	Wind creek	\$22,500
1931 Smail Creek 1915 Smail Creek 1916 Smail Creek 1917 Black Lake 1915 Black Lake 1915 Black Lake 1922 Grade Separation 1922 Grade Separation 1920 Over hwy 1920 Over hwy 1920 Over hwy 1915 Saunders Lake 1916 Saunders Lake 1917 Saunders Lake 1918 Saunders Lake 1919 Saunders Lake 1919 Saunders Lake 1919 Saunders Lake 1910 Saunders Lake 1911 Saunders Lake 1912 Saunders Lake 1912 Saunders Lake 1913 Saunders Lake 1914 Saunders Lake 1915 Saunders Lake 1916 Saunders Lake 1917 Saunders Lake 1917 Saunders Lake 1918 Saunders Lake 1918 Saunders Lake 1918 Saunders Lake 1910 Saunders Lake 1911 Saunders Lake 1912 Saunders La	75 ft BD PT	1929	Wind creek	\$22,500
1929 Smail Creek 1915 Smail Creek 1978 Black Lake 1915 North Lake 1932 Ten Mile creek 1932 Ten Mile creek 1932 Grade Separation 1939 Over hay 1940 Cleer Lake 1915 Saunders Lake 1915 Saunders Lake 1915 Sunders Lake 1916 Sunders Lake 1917 Sunders Lake 1918	90 ft BD PT	1931	Small Creek	000'22\$
S, 513 ft OD PT 1978 Black Lake 1978 Black Lake 1915 1922 1932 1932 1932 1940 1	30 R BD PT	1929	Small Creek	000'6\$
S, 513 ft OD PT 1978 Black Lake 1915 North Lake 1915 North Lake 1922 Grade Separation 1929 Over they 1940 Clear Lake 1915 Saunders Lake OVER WATER 1917 OVER LAND SUBTOTAL 10% MOBILIZATION TOTAL COST	75 ft OD FT	1915	Small Creek	\$22,500
S, 513 ft OD PT 1915 1915 1915 1922 1932 1932 1932 1940 1	930 ft BD CB	1978	Black Lake	0\$
1915 North Lake 1932 Ten Mae creek 1932 Grade Separation 1929 Over hwy 1940 Clear Lake 1915 Saunders Lake 1915 Butterfield Lake 1915 Tigal Creek OVER WATER OVER LAND SUBTOTAL 10% MOBILIZATION TOTAL COST		1930, 1915, & 1930	North Lake	\$486,900
1932 Ten Mule creek 1932 Grade Separation 1940 Clear Lake 1940 Clear Lake 1945 Saunders Lake 1940 Clear Lake 1940 Clear Lake 1940 Clear Lake 1940 OVER WATER 1940 OVER ROADWAY 1940 OVER LAND 1940	320 ft OD PT	1915	North Lake	000'96\$
1929 over hwy 1940 Clear Lake 1915 Saunders Lake 1915 Saunders Lake 1915 Iddl Creek OVER WATER OVER LAND SUBTOTAL 100% MOBILIZATION TOTAL COST	180 ft OD PT	1932	Ten Mile creek	\$54,000
1929 over hwy 1940 Clear Lake 1915 Saunders Lake 1915 Sumders Lake 1912 Ixial Creek OVER WATER OVER LAND SUBTOTAL 100% MOBILIZATION 100% CONSTRUCTION CONTINGENCIES	105 ft OD PT	1932	Grade Separation	\$31,500
1915 Saunders Lake 1915 Saunders Lake 1915 Butterfield Lake 1912 Tytal Creek OVER WATER OVER LAND SUBTOTAL 10% MOBILIZATION TOTAL COST	41 ft OD SBS	1929	over hwy	\$30,750
1915 Saunders Lake 1915 Butterfield Lake 1912 Tydal Creek OVER WATER OVER LAND SUBTOTAL 10% MOBILIZATION 107	75 R OD PT	1940	Clear Lake	\$22,500
1915 Butterfield Lake 1912 Total Creek OVER WATER	75 R OD FT	1915	Saunders Lake	\$22,500
1915 Butterfield Lake OVER WATER OVER LAND OVER LAND SUBTOTAL 10% MOBILIZATION TOTAL COST	75 ft OD PT		Saunders Lake	\$22,500
OVER WATER OVER WATER OVER LAND SUBTOTAL 10% MOBILIZATION TOTAL COST	75 R OD PT	1915	Butterfield Lake	\$22,500
	45 ft OD SPT	1912	Tidal Creek	\$33,750
			OVER WATER	\$20,959,250
			OVER ROADWAY	\$199,500
			OVER LAND	\$68,400
			SUBTOTAL	(\$2)1/2511/25
			10% MOBILIZATION	900/2001/20
<u></u>		40% CONSTRU	CTION CONTINGENCIES	098/069/85
			TOTAL COST	92/10/2019/93

744 24 744 44 744 48 748 68 748 68 748 68 748 68 750 46 75

PUBLIC VERSION

BEFORE THE SURFACE TRANSPORTATION BOARD

STB FINANCE DOCKET NO. 35160

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SEP 30 2008

MANAGEMENT

OREGON INTERNATIONAL PORT OF COOS BAY
—FEEDER LINE APPLICATION—
COOS BAY LINE
OF THE CENTRAL OREGON & PACIFIC RAILROAD, INC.

SUPPLEMENTAL REPLY OF THE OREGON INTERNATIONAL PORT OF COOS BAY

Exhibit 4

Tunnel Report

Office of Francisco





September 26, 2008

Ms. Betsy Imholt, ODOT Rail Study Director ODOT Rail Division 555 13th Street NE, Suite 3 Salem, OR 9731-4179

RE: ODOT RAIL STUDY - CENTRAL OREGON AND PACIFIC RAILROAD, COOS BAY SUBDIVISION

Dear Ms. Imholt:

As per your e-mailed approval and direction on September 9, 2008, we have coordinated with Rail America and the Central Oregon and Pacific Railroad (CORP) to visit a limit of four of the nine tunnels on the Coos Bay Subdivision. The Coos Bay Alignment and tunnels are shown in Figure 1, and more detailed locations of each of the nine tunnels along the alignment are shown in Figures 2 through 8. This letter documents our assessment of changes that have occurred in Tunnel Nos. 13, 15, 17, and 18 since we prepared an earlier report to Rail America dated July 16, 2007, entitled, "Tunnel Inventory Coos Bay Subdivision, Oregon," that they subsequently made public. We have also included and updated Tables 1 through 11 to reflect increases in estimated costs to reflect cost escalations since our report of 2007

As per your authorization, we performed a field review and updated our condition assessments for Tunnel Nos. 13, 15, 17, and 18 on September 12 and 13. CORP staff provided flagging services and designated a railroad employee to escort and provide access via hy-rail to the Shannon & Wilson, Inc. field crew during the tunnel visits. We visited and logged Tunnels 13 and 15 on September 12 and Tunnels 17 and 18 on September 13. The portals to all four tunnels were blocked with locked chain link fence panels; however, in past months vandals had detached the gates in order to run vehicles, possibly recreational all-terrain vehicles (ATVs), through Tunnel 13.

The tunnel review process was undertaken by our project manager, Robert Robinson, and senior engineering geologist, Klaus Winkler, both of whom had previously visited all nine tunnels in order to develop the 2007 tunnel condition assessment report for Rail America.

Ms. Betsy Imholt ODOT Rail Division September 26, 2008 Page 2

During our review process, we noted minor changes in the nature and condition of the tunnel support system and the condition and stability of the rock, where visible.

As stated and described in detail in our tunnel inventory report dated July 2007, we identified and classified numerous sections in the tunnels that are in various states of deterioration and, in our opinion, require immediate (within six months) to long-term (30 to 48 months) rehabilitation work in order to reduce the currently high risk of rock falls and timber collapses to more acceptable levels.

Since November 2006, minor rock falls and isolated failed timber sets were observed in tunnels in the Coos Bay Subdivision

- ▶ Tunnel 13
 - At Station 14+00, five timber ribs that were previously logged as rotted and settled by 6 inches have settled an additional 6 inches and kicked inward by approximately 6 inches.
 - Approximately 5 to 10 percent of the wood foot-blocks have rotated due to ATV traffic in the drainage ditches.
 - Several small 1 subjection to 1 cubic yard (ey) rock and wood debris falls.
- ▶ Tunnel 15
 - Station 15+40 west post-shifted off foot-block.
 - Station 19+80 rockfall through Hole in shotcrete arch of approximately 1 cy.
- ▶ Tunnel 17
 - No significant changes in last year.
- ▶ Tunnel 18
 - No significant changes in last year.

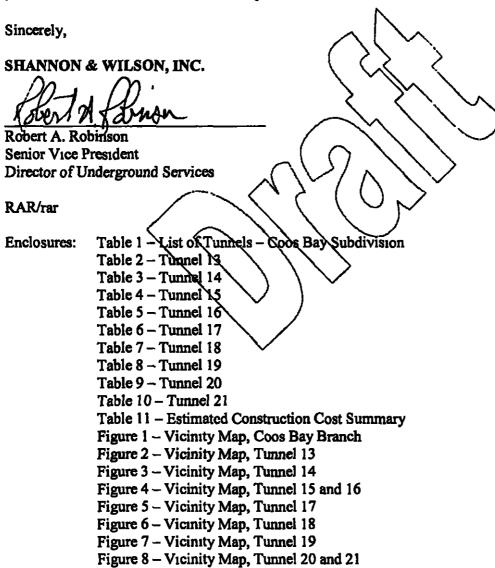
In our opinion, the repairs recommended for tunnel sections that were classified as Repair Level 1 and 2 in our July 2007 report are necessary to reinstate relatively safe train passage. The risk of future rockfalls and failing timber sets is high under the current condition of the tunnels. However, the increased seepage rate in some areas of the tunnels that normally accompanies the rainy season will contribute to an increased risk of instability and also makes the application of

24-1-03505-002-L1 doc/wo/LKD 24-1-03505-002

Ms. Betsy Imholt ODOT Rail Division September 26, 2008 Page 3

remedial shotcrete in these seepage areas impossible and hazardous. Consequently, it may not be safe for much of the repair work to be undertaken until the drier months of spring and summer.

We appreciate the opportunity to work with you and look forward to answering any questions you have about the information in this report.



24-1-03505-002-L1 doc/wp/LKD 24-1-03505-002

ODOT RAIL STUDY LIST OF TUNNELS - Coos Bay Subdivision

			60
G. Turnel Liner	LAT. LONG. T	LONG.	LAT. LONG.
349 concrete portal barrels	44 0279 123 4649 concrete porta	44 0279 123 4649	123 4649
s/6 portal concrete barrel	43 9996 123 6376 portal concrete	43 9998 123 63/6	123 63/6
Shotcrete over steel and timber sets under sets and lagging, N & S portal are 50 M in pro concrete barrels	Shotcrate over timber sets tim lagging, N & S 43 9291 124 0408 R bing concept	43 9291 124 0408	124 0408
	124 0298	43 925 124 0298	Coos Bay 43 925 124 0298
Shotonia succhadada hadanak	of rew alaminated		
	sets, shotcreted at 43 8516 124 0859 & S. portal concre	43 8516 124 0859	124 0859
1			
tumber sets tumber sets and lagging N & S portal are 50 ft	manager services and services are services and services and services and services and services a	umber sets umber parts umber sets umber parts umber parts with a S part of S S N & S part of S S S S S S S S S S S S S S S S S S	nod S. S. V. gruggel
╗	43 763 124 1177 long concrete ban	43 763 124 1177	124 1177
Shotcrate over bedrock,	Shotcrate over bed	Shotcrate over bed	Shotcrate over bed
Snotcette over steel sets 3 306 portal 50 ft concrete barrel	43 6473 124 1006 portal 50 ft concre	43 6473 124 1006	124 1006
	1077	407 4700	2001 07
7	43 5966 124 1493 DOMBI 50 II CONCIR	43 5956 124 1493	124 1483
Shotcrete over bedrock, N & S portal are 50 ft long	Shotcrete over by S portal are 50 ft	Shotcrete over by Shotcrete over by Shotcrete are 50 ft	
595 concrete barrels	43 5831 124 1595 concrete barrels	42 KB24	_

Note Only Tunnels 13, 15, 17, and 18 were revisited for this review

Total Length 14,077 ft

11817kgw 9/29/2008

Table 1

24-1-03506-00 ODOT Raif Study Coos Bay Subdivesion Lat of Turnois Tabio 2

ODOT RAIL STUDY TUNNEL 13

Shannon Wilson Inc

A	MP 669.47 to 669.	Coos Bay Subdivision,
	to 669.94	Vision, Oregon

14+83 64 Sholorote over Steel 2 Y 0	Timber Sets on Wood Foot Blocks with N N N N N N N N N N N N N N N N N N N	Imbor Sats on Wood for bocks with Inches sets at 4-spacing on wood for bocks with under legang of the space o	Timber Sets on Wood Foot Blocks with 12+74 282 12+74 282 12+74 282 Timber Legging 4 N Timber Legging	3 Unimed - N	8+15 80 Foot Blocks with Timber Legging 4 N Timber Sets on Wood Foot Blocks with Timber Legging 4 N	2 2	4+40 6+18 178 Timber Lagging 4 Y 0 Sig 8+18, Concrets curb ents a Timber Sets on Wood Timber sets at 4*-apacing on wo Fox Blocks with Timber Lagging 4 N Timber sets at 4*-apacing on wo Timber sets at 4*-apacing on wo Timber Lagging 4 N Timber sets at 4*-apacing on wo Posterometric Innocretal Inno	۲	4 2 Y	Shokrete over Steel 4 Y 0	۲	To Length, it Repair Level Lining Concrete Curb
Shoicreled steel sois at 2'-spacing on concrete curb. Shortcrete application. Blockfill void space bothind legging with comeniations metorial is 6"-10" thick, Shortcrote was placed over existing timber legging. 4"-5" wide (Void space average 3"-wide) void space between bodrock and shotcreted sets along cest adewall and in the crown, 2"-wide void space between bodrock and shotcreted sets along wast safewall.	!	<u> </u>	3388883333	et high aco roughness is aco roughness i		Ignorally (no cracks or squoozing) Dy Imber sets at 4-specing or wood foot blocks with timber lagging foot blocks in fair condition, Dry. End of carve at -Sta 7-00	<u>. ! ! </u>	Timber sets at 4'-spacing on concrete curb with timber lagging. Bottoms of (Current conditions of timber land) (Current conditions of timber land) (Current conditions of timber land) and sets are fair two timber sets are noticed at Sta 5-95, shifted on top of concrete curb. Bedrock 2'- 3 5' behind lagging, bedrock appears massive with healed may could provide in those socious in the fair providers and seed seed filed resistancy with the highest providers and seed filed free foreigning.	1	Shortcrets over steel sets at 2'-specing shotcrets is flush with steel sets (-8" 10" thick). Timber legging likely still in place, Concrete shoot dich extends 2', below TOR, Several drip locations, heavy drip from west spring line at Sta 2+80 Shatcrets over steel sets at 4'-spacing shotcrets is 5'-10" thick, Concrete	*specing shotcrete is 4"-6" thick, Concrete	Comments
	5 300 1872	24 1440 8566 158 119	The sand	21 1260 8480 106	14 840 5112 64 71	<u> </u>		1 60 432 5				ft No Rome LF ft cy ft cy ft No
	5 rabs kucked an -6 an, droppod 12" on east 8 sado	<u> </u>	, , , , , , ,	1/2 cy now rock tell in dileches	.						1 11	9/12/08 Visit

ODOT RAIL STUDY TUNNEL 13 Coos Bay Subdivision, Oregon MP 669.47 to 669.94

-1 cy rock and wood debris in drich	<u>8 1</u>	 	<u>•</u>	2	<u>1</u>	N	<u> </u>	Exposed bedrock in fair condition, ROD -60-70% in east sidewall, ~80-90%, - Install rockbolts (row-spacing 5 feet as 12-long rockbolts per non-70-80% in west sidewall (all est)	Exposed bedrock in fair condition, ROD ~60-70% ii in crown, ~70-80% in west sidewall (all est)		Щ		Unined	3	9	19+75	19+66	_
 	\ \			<u> </u>		<u> </u>		te curb. Shotcrete Beckfill void space behind legging with comenterioris material ver existing timber legging. (Potentially 2"-wide void space)	Shotcreto over steel sats at 2"-spacing on concreta curb Shotcrete application -4"-6"-thick Shotcrete was applied over existing briber lagging	0	-	lecil 2	Shotardo over Steci		46	19+68	19+20	
	I							ed over	Shotoroto over stool sots at 2'-spacing on concrete curb. Shotorete application flush with stool sets (-6'-10'-thick). Shotorete was applied over euisting timber lagging.	-		- §	Shotcrete over Steel		76	19 20	18+44	
debris in ditch		_	ω	288	77 2	_		ואואבם	Exposed bodrock with apparent recent rockfall (roc				Unlined	2	 - 	18+44	18+40	
		13	<u>=</u>	938	216 9	ယ			ligging and detanorated posts along west adewall	Z		\$ S 5	Timber Legging on Wood Foot Blocks	3	13 	18+40	18+27	
_	<u>3</u>	118		8568	1728	24		7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7	I immer sets at 4 -spasing on wood look with under legging, sets, lagging, and foot blocks generally in fair condition. Appearantly competent before close behind lagging typically. Damp legging between Sta 17+20 to 17+36. Damp and rotted legging between Sta 17+61 to 17+69. Ding at cest springline at Sta 17+63. Ding at cest springline at Sta 17+67. Ding at cest springline at Sta 17+67.		<u> </u>	5 5 5	Timbor Sets with Timbor Lagging and Wood Fool Blocks		119	18+27	17+08	
	<u> </u>	 		1368			<u> </u>	g), - karnave umber ests, wood foot blocks, and umber eigging, tul clean foolings, and apply 4"thick stool fiber reinforced shoics between steel sats. Use shotcrets to be in steel web and for flooting support.	Stool sets installed between easting timber sets (timber sets at 4-spacing), wood boards were used to strap socion together stool set footings are cut thearns un-place timber lagging generally dry		<u> </u>	SIF A	Stool Sets on I-boarns and Timber Sets with Timber Lagging		19	17+08	16+89	
	<u> </u> 9	ਜ਼ [28	2 2 2 2	432 Z	 			Timbor sats at 4-specing on wood tool blocks with limbor legging. Ratted legging condition of tool blocks fair to very poor throughout section. - Drip from crown at Sta 16+62	z 	<u> </u>	\$ 9 F	Timber Sets with Timber Lagging on Wood Foot Blocks	3	31	16+89	16+58	
	ñ	1	39	3168	648	5 0		wast 1	Timber sets et 4-spacing on wood foot blocks with timber legging Deternated sets, legging, and wood foot blocks at vanous stages. - Timber legging in 1/4-srch rotted - but mostly shill in place - stong wost sidewall between Sta 16+34 and 16+49 deterioration along backside of timber posts, foot blocks in fair condition.	Z	_	rood 4	Timber Sets on Wood Foot Blacks with Timber Lagging	9-4	‡	16+58	16+14	
	ಸೆ	å.		3240	32	φ					<u> </u>	h rood	Timber Sets on Wood Foot Blocks with Timber Lagging	(2)	5	.6+14	15+69	
	6	20	5	1440	288 14	4		- R0156	Timbor sets at 4 -specing on wood foot blocks with tagging. Bedrock appears to be competent.	2	<u> </u>) boot 	Timber Sets on Wood Foot Blocks with Timber Lagging	3-4	8	15+69	15+49	
	(20	2 0	<u>8</u>	2088	450	<u>a</u>		th timber lagging Remove timber lining install rockbolts (row-spacing 5 feet five 15-long rockbolts per row) and apply 6"-thick steel fiber 15+33 to 15+49 along east reinforced shotcrete		z	<u> </u>	4	Timber Sets on Wood Fool Blocks with Timber Legging	(S)	BK .	1549	15+20	
	ω_ <u></u>	o	<u> </u>	578	5	N.			Tembor sets at 4-specing on wood foot blocks with timbor legging. Ro and deteriorated tembor sets (3) advanced deterioration of wood foot blocks rotted legging as failing out, Exposed bedrock along east sidew 2-2-3-sag along west sidewall from Sta 15-00 to 15-33 (extends into following section - see below)	z		y h cod	Timber Sets on Wood Foot Blocks with Timber Lagging	(a)	8	15+20	15+12	
' <u>\$</u> 		25	3 5	1800 3	36 8 16 2	 υ	<u> </u>		Timber sets at 4*spacing on wood foot blocks with timber lagging. Advanced detenoration of wood foot blocks, rotted lagging is falling out. - 4*-5*-sag along east aclewell from Sta 14+83 to 15+12	z		7 1 3 8	Unlined Timber Sets on Wood Foot Blocks with Timber Legging	208	25 .	14+87 15+12	14+83	
9/12/08 VIsit 7 block of rock on 1/4	No 27 L	r (s)	72	12	+	Rows	₹	sx 12'-long rockbolts per	Exposed bedrock, Separated rock blocks in crown,	F =	\neg	Set Spacing, it	Туре		Catagori, A	10	From	
Comments	- 196		Concret	Shotcrate	┨	Rockbotta	Steel Sets	Repairs	Comments	Concrete Curb	-			Receir Leval	Length #	3		_

ODOT RAIL STUDY TUNNEL 13 Coos Bay Subdivision, Oregon MP 669.47 to 669.94

	3 - 4 Steel Sets on I-beams		Stoci Sets on I-beams		3 · 4 Steel Sets on I-boams		Steel Sets on I-bosms		Stool Sets on I-beams			Shotcrete over Steel	Stoel Sets on I-beams			de see
	Z		z		Z		* z		z			* *	Z			set spacing, it T/M Above LUK, in
Steel sets at 4'-spacing founded on I-beams. Existing timber lagging was left in place rotted timber lagging with bedrock dobris behind. - Day-lighted accion in crown between ~Sta 24+20 and 24+31, flowing	odin mas na dieser sind in Briffer namen onder nich	Steel sets at 4-specing founded on i-beams. Existing limber legging was left in place, limber legging is rotted and ready to fall into turnet. Bedrock appears to be close behind legging along east sidewall. Generally 3 to 4 or		Steel sets al 4-spacerg founded on i-beams. Existing traiber legging was left in place timber legging is rotted and falling into tunnel. Rock dobins collected behind legging, Rockfall malerial and rotted legging on tracks along east sidewall.		Sieel sets at 4-specing founded on Hosens. Existing timber legging was left in place. Timber legging mitted in places	Sta 22-97 to 23+23	Sident sets at 4-spacing on I-potents, Existing unitide tagging was birt in place, timber legging is rotted and falling into turnel. Rock debris collected behind legging. Occasional rock fall is evident (see below).			place Styrobam was used to backfill large void space between lagging an bedrock	sets, Shotcrate was placed over oxisting timber lagging, Shotcrate or concrete footing throughout section. Shot arts at 2-concret on Lincons. Footing traber become use left in	Shotcrated steel sets at 4"-specing, Shotcrate application is flush with steel		Steel sets at 2'-specing on I-bearns. Wire mesh was installed between sets. Timber legging was left in place. Large void space between existing timber legging and bedrock locally.	
Remove timber legging and all toose debns behind legging - Apply 6"-thick stool fiber renforced shotcrate between stool sets. Use shotcrate to tie in steel web and for fooling support	on Install steel channol legging between steel sets and backfill void space with cementious material		Install stoel channel lagging between steel sets and backfill ward space with comentous material	Remove tember legging and all loase debns behind legging Apply 6" thick sloel fiber remforced shotcrete between sloel sets. Use shotcrole to be an steet web and for footing support OR	Install steel channel legging between stock sots and backfill void space with comembous material	Remove turbor legging and all loase debnis behind legging Apply 6"-thick stool filter reinforced shotchete between steel sets, Use shotchete to be in steel web and for footing support OR	Install steel channel lagging between steel sets and backfill void space with cementicous material		mstallabon of stool channel logging botwonn steel sets and backfilling void space with comentious material.	aholorete is recommended in the future in order to maintain the long-term stability of the tunnel Future repairs should include missister or control of the tunnel Future repairs should include missister of recitoris (rew-specing 5 feet fine 12-long recitoris per reve) and application of 4"-thick steel fiber reviewed shotcrete.				Into imber wing with rockoots and stock noor removed shotchets is recommended in the future in order to maintain the long-term stability of the tunnet. Future repears should include installation of rockbots (row-spacing 5 feet. five 12-long rockbots per row) and application of 4°-thick steel filter removaded shotcheto.		_
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	224		26		28		46		 							ţ.
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	Steel sets at 4'-spacing founded on I-beams. Existing timber lagging was left in place rotted briber lagging with bedrock debris behand. - Day-lighted section in crown between -Sta 24+20 and 24+31, flowing.	Steel Sets on I-beams 4 N Steel sets at 4-spacing founded on I-beams Existing timber lagging with betrock dobris behind. Steel sets at 4-spacing founded on I-beams Existing timber lagging with behind. - Day-lighted section in crown between - Sta 24+20 and 24+31, flowing sets Use a stockrote to be an steel web and for fooling support	Steel sets at 4*-spearing founded on I-bearns . Existing timber lagging and all loose debnis behind lagging left in place, limber lagging is rolled and ready to fall info turnet, Bodrock . Apply 6*-thickstool fiber reinforced shotcrast behind lagging left gents at lagging along east sidewall, Generally 3* to 4* of sets, Use shotcrast to be in steel web and for footing support on the sets and backfill void space with cernantious material space with cernantious material space with cernantious material space with cernantious material loose debnis behind lagging left in place rolled by the first at last of sets under the sets at 4*-spacing founded on I-bearns . Stated Sets on I-bearns 4 N Steel sets at 4*-spacing founded on I-bearns Existing timber lagging was left on sets at 4*-spacing founded on I-bearns . Apply 6*-thick stool fiber reinforced shotcrast between stool . Apply 6*-thick stool fiber reinforced shotcrast between stool . Apply 6*-thick stool fiber reinforced shotcrast between stool . Apply 6*-thick stool fiber reinforced shotcrast between stool . Apply 6*-thick stool fiber reinforced shotcrast between stool . Apply 6*-thick stool fiber reinforced shotcrast between stool . Apply 6*-thick stool fiber reinforced shotcrast between stool . Apply 6*-thick stool fiber reinforced shotcrast between stool . Apply 6*-thick stool fiber reinforced shotcrast between stool . Apply 6*-thick stool fiber reinforced shotcrast between stool . Apply 6*-thick stool fiber reinforced shotcrast between stool . Apply 6*-thick stool fiber reinforced shotcrast between stool . Apply 6*-thick stool fiber reinforced shotcrast between stool . Apply 6*-thick stool fiber reinforced shotcrast between stool . Apply 6*-thick stool fiber reinforced shotcrast between stool . Apply 6*-thick stool fiber reinforced shotcrast between stool . Apply 6*-thick stool fiber reinforced shotcrast between stool . Apply 6*-thick stool fiber reinforced shotcrast between stool . Apply 6*-thick stool fiber reinforced shotcrast between stool . 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Steel sets at 4-specing founded on I-bearns Existing limber legging was left with cemenitious material. Remove timber legging and all loose debris behind legging sets at each web and for fooling support. 3024 2	Sheel seits at 4-spacing founded on I-bearns. Existing lumber legging was always on I-bearns. Sheel seits at 4-spacing founded on I-bearns, Existing lumber legging was always and all locase debnis behind legging, notified and ready to fall unto lumes, facilities and backfill ward space with camentous material. Sheel sets on I-bearns. Sheel sets on I-bearns. Sheel sets at 4-spacing founded on I-bearns, Existing lumber legging was explained behind legging in crown, Damp to woll with drips. Sheel sets on I-bearns. Sheel sets on I-bearns. Sheel sets on I-bearns. Sheel sets at 4-spacing founded on I-bearns, Existing lumber legging was explored to be in steel who and for fooling support on the install sets of charmon legging between steel legging was pace with camentous material. Apply 6-thick steel charmon legging and all locase debnis behind legging was leaves to be a factorial to be in steel who and for fooling support least and space with camentous material. Apply 6-thick steel charmon legging was between steel least and backfill ward space with camentous material. Apply 6-thick steel charmon legging was existed with a steel who and for fooling support least and space with camentous material. Apply 6-thick steel charmon legging and all locase debnis behind legging was existed with camentous material. Apply 6-thick steel charmon legging was packed with camentous material. Apply 6-thick steel charmon legging was packed with camentous material. Apply 6-thick steel charmon legging was packed with camentous material. Apply 6-thick steel charmon legging was set of the material space with camentous material. Apply 6-thick steel charmon legging was set of course debnis behind legging was packed with camentous material. Apply 6-thick selection is the weet and for fooling aupport legging was packed with camentous material. Apply 6-thick selection is the weet and for fooling aupport legging was packed with camentous material. Apply 6-thick selection is the weet and for fooling aupport legging was a few p	3 - 4 Steel Sets on I-bosants 4 N Steel eats at 4-spacing founded not I-bosants Existing timber legging was Romonitous material seel channel legging was Romonitous material space with commonitous material seed and selected between steel commonitous material seed and selected between steel sets were and selected between steel sets with commonitous material seed and selected between steel sets with commonitous material seed in a steel when and for fooling support or passes selected in place, tember legging was selected in place and selected between steel sets and selected selected between steel sets and selected sele	Steel Sets on I-boarns 4 N Steel Sets on I-boarns 5 Steel Sets on I-boarns 4 N Steel Sets on I-boarns 5 N Steel Sets on I-boarns 4 N Steel Sets on I-boarns 5 N Steel Sets on I-boarns 6 N N Steel Sets on I-boarns 6 N Steel Sets on I-boarns 6 N Steel Sets on I-boarns 6 N N Steel Sets on I-boarns 6 N N Steel Sets on I-boarns 6 N N Steel S	Stand Seas on I-bosoms 4 N Signal seas of 4-spacing founded on I-bosoms Existing umbor lagging was being seas of the season and se	Seed Sets on I-boarns 4 N Seed sets of I-boarns 5 N Seed Sets on I-boarns 4 N Seed sets of I-boarns 5 N Seed Sets on I-boarns 4 N Seed sets of I-boarns 5 N N	Sool Sate on I-basans 2 N Speak sets on I-basans 4 N Speak sets on I-basans 5 N Speak sets on I-basans 6 N N Speak sets o	Sted Sets on Hotelman 2 N Sted Sets on Hotelman 4 N Sted Sets on Hotelman Sted Sets on Hotelman	Seed Bast on I-basens 2 N Seed Bast on I-basens 3 N Seed Bast on I-basens 4 N Seed Bast on I-basens 4 N Seed Bast on I-basens 2 N Seed Bast on I-basens 3 N Seed Bast on I-basens 4 N Seed Bast on I-basens 4 N Seed Bast on I-basens 5 N Seed Bast on I-basens 5 N Seed Bast on I-basens 5 N Seed Bast on I-basens 6 N Seed Bast on I-basens 8 N Seed Bast on I-basens	Short State on Lobarns Short State on Lobarns Short State on Lobarns Short State on Lobarns N	Since Stad or 1-barrier Studies on Stud A V Studies of the company by the company by the company of the com	Easy log to 1 January 2 N Standard and a first of Coppore, Scholars and placed one control of the standard of the coppore, Scholars and placed one control of the coppore control of the coppore, Scholars and placed one control of the coppore contr	Size in the C special policy of the common and proper in the common and proper in control and proper in contro

ODOT RAIL STUDY TUNNEL 13 Coos Bay Subdivision, Oregon

MP 669.47 to 669.94

24+31 24+96 65
24+96 24+96 0
Total Longth (††) 2496
Repair Level 3 (††) 196
Repair Level 3 (††) 159
Repair Level 3 (††) 159
Repair Level 3 (††) 138
Repair Level 4 (††) 138
Repair Level 5 (††) 136 Repairs should be completed immediately to 45 months
Repairs should be completed in 0 to 12 months
Repairs should be completed in 12 - 30 months
Repairs should be completed in 30 - 48 months
No immediate repairs required based on the current conditions Length, ft Repair Level Concrete Portal Type Lining Concrete Curb
Set Specing, ft Y/N Above TOR, in COST ESTIMATE FOR REPAIR LEVELS 1 TO 5

Est Total Stock (No.)

Est Total Rockbolts (LF)

Est Total Concrete (cy)

Est Total Shotcrete (cy)

Est Total Shotcrete (cy)

Est Total Total Timber Sets (No.)

150 (Est Unit Rates \$1000/per CY)

1243 (Est Unit Rates \$1000/per CY)

1350 (Est Unit Rates \$1000/per CY) Concrete barrel
- Crack across barrel at Sta 24+71 with some spalling and water secpage along crack
South Portal @ MP 669 94 Rates \$5300/per set)

Rates \$55ppr LF)

Rates \$100/per CV)

Rates \$100/per CV)

Rates \$100/per CV)

Rates \$100/per CV)

Rates \$1000/per CV)

Rates \$1000/per CV)

Rest Total Construction Costs

\$400,000

Royal Unit Rate \$1600/per set)

Est Total Removal Costs

Mobilization (15%) \$9,983

Contingency (20%) \$133,150

Est Total of Level 1 and 2 (incl Level 2-3) Construction Costs \$89,763 Est Total Construction Costs
set) Est Total Removal Costs Total Construction Costs
Total Construction Costs
Total Construction Costs
St. Total Construction Costs
St. Total Construction Costs
St. Total Construction Costs
St. Total Construction Costs
Est Sub Total for Repairs \$2.287 910
Mobilization (15%) \$338 687
Contingency (20%) \$451 582
Est Total of Construction Cost \$3,048,179 Total Steel Sets Rockbotts
R No Rows LF

24-1-03505-00 ODOT Rail Study Coos Bay Tunnel 13

Table 2

Commenta 9/12/08 Visit

ODOT TUNNEL REVIEW TUNNEL 14 Coos Bay Subdivision, Oregon MP 681.09 to 681.18

_						_		<u> </u>				_		-	П	П	П
Total Length (ft)	4+71		4+51			1+90		0 +9 0				950		ĝ	8	From	Station
7gh (f)	4+71		4+71			4+51		±				0+90		Š	9	To	
471	0		20			261		100				8		8	; 		Langth, ft Repair Level
																	Repair
	Z.		Sh			S		S				S					1046
	Shotcroto over Steel Sets		Shotcroto over Steel Sets			Shotcrole over Bedrock		Shotcrete over Bodrock				Sholcrete over Bedrock		Concrete Barrel	Concrete Portal	Type	
	r Steel Sct		r Sheel Sch		:	er Bedrock		er Bodrock				er Bedrock		Bernel) Portel	*	Uning
	2		2 and 4									[Set Specing, ft	
	2		4									<u>_</u>			L	Kung, ft	
	Y		4			z		z				z		z	z	Y/N A	Conc
	Ü		ü											' 		Above TOR, in	Concrete Curb
		South P	Last thr	shotcrot	Shotcre	relative	Shotere		with spe	rounforce	Shotore	relative	Shotore	In gene	North P	n.)	٦
		South Portal 🗱 MP 681 18	Last three steel sels at South Portal are at a 2'-apacing	shotcrete cover (2"-4") Top	Shotcrete over steel sets at 4'-spacing on concrete curb relatively thin	relatively thin in crown (<1"	Shotzrete cover over bedrock generally in good condition, Shotzrete is		with spalling shotcrate in crown. Crown is built up by one bedding plane.	rounforced, thickness in sidewalls estimated to be around 2", Large areas	Shotcrate cover over bedrock very thin in crown (0.5" to 1") and not	relatively thin in crown (<1") and not reinforcod	Shotcrete cover over bedrock generally in good condition, Shotcroto is	In general dry. Spalling concrete in east sidewall at Sta. 0+24.	North Portal @ MP 681 09		
		681 18	s at South	(Top or	bi sets at 4"	>vm (<1")a	er bedrock		MOLD IN 810.	sa in sidow	er bedrock	VMT (<1") 8	er bedrock	iling concri	681 09		
			Portal are	of concrete curb is 2 to 3 inches below TOR,	-spacing o) and not residenced	generally i	1	u Crown t	alla ostima	very thin a	nd not row	generally r	cto in east			Comments
		į	el a 2'- <u>ape</u>	பர் 19 2 to	n concrete	forced	n good cor	İ	s busit up b	e ed or pa	COWN (0	forcod	n good cor	Sidowall at			
			<u>2</u>	3 inches b	curb relat		ndition, Shi	ı	y one bede	round 2", L	5" to 1") ar		ndibon, She	Sta 0+24	' 		
		İ		Blow TOR,	very thin	 			ing plane	arge areas	줐		otcroto 15		 		
	_					<u> </u>		<u> </u>	bollom	poursep	Cover 8	 			\vdash	L	1
									bottom of sidewalls (2"-thick over oxisting shotcrote)	desired thickness of 4 inches, new application shall extend to the	Cover spaling areas with sicel fiber reinforced shotcreto to	 					
	•							ļ	(2"-thick o	f 4 inches,	s with stoo						
								ļ	wer oxistiny	new apple	il fiber rent						Rapairs
			[i	g shotcrate	ation shall	orced shot				L		
Total						 			_	oxtend to	croto to				! !		
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١						<u> </u>										Ē	Steel Sets
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0	_		!	_		<u> </u>		_			_	_		-	_	<u>[</u>	

No immediate repairs required based on the current conditions	Repairs should be completed in 30 - 48 months	3 Repairs should be completed in 12 - 30 months	Repairs should be completed in 0 to 12 months	Ropairs should be completed immediately to <6 months	epar Level
conditions				nths	

60 000	Mobilization (168)			
\$86,000	Est Sub Total for Repairs \$86,000			
80	Est Total Removal Costs	0((Est Removal Unit Rate \$1500/per sol)) 0	Est Total Timber Sets (No
\$68,000	Est Total Construction Costs	6 (Est Unit Rates \$1000/per CY)	66	Est Total Shotcrete (cy)
80	Est Total Construction Costs	(Esi Unit Ratos \$110/per CY)	0	Est Total Concrete (cy)
80	Est Total Construction Costs	0 (Est Unit Rates \$85/per LF)		Est Total Rockbolts (LF)
30	Est Total Construction Costs	0 (Est Unit Rates \$5300/per set)		Est Total Steel Sets (No.)
		TO 5	EPAIR LEVELS 1	COST ESTIMATE FOR REPAIR LEVELS 1 TO 5

Mobilization (15%) \$9 900 Contingency (20%) \$13,200 Est Total of Construction Cost \$89,100

24-1-03505-00 ODOT Rail Study Coos BayTunnel 14

ODOI RAIL STUDY

2	03+86	03+72	D3 • \$6	03+32	03+20	03+08	02+83	02-77	02+15	02+10	0147	01+35	9 8	900	From
	Q+15 15	03+86	\$.	03+58	03+32	03+20	සි .	02 +8 3	02+77	02+15	용 6	01+47	01+35	9	То
.	28	14	ਰੰ	24	12	ž	ជ	<u>,</u>	62	O1	2 	 	188	0	
		3	<u>0</u>	(2)	\$	Ø .		3		3					repair serves
Steel Archos on Steel and Timber Posts, Shotzecled	Timber Sets on Concrete	Timber Sets on Concrete Curb with Timber Legging	Timber Sels on Concrete Curb with Timber I agging	Timber Sets on Concrete Curb with Timber Lagging	Timber Sels on Concrete Curb with Timber Legging	Timber Sets on Concrete Carb with Timbor Lagging	Timber Sals on Concrete	Timber Sets on Concrete Curb with Timber Lagging	Timber Sets on Concrete Curb with Timber Lagging	Timber Sets on Concrete Curb with Timber Legging	Timber Sets on Concrete Curb with Timber Laggung	Timber?) Sets on Concrete	Shotorete over Steel Sets on Concrete Curb	Concrete Portal	Тура
3	1520	15	ō	15	10-20	10-20	20	20	1020	15	15	NA NA	40		Set Specing, ft
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		ī		ı	1			-		: 		 			Height ab
•		Ga	a	6	6	6	6	(S)		6	CR .	•	•		Height above TOR, in
Wood ribs w/ steel strags - 3 full steel sets (4' spacing) were establed ofter a cave in/cottagee occurred in the west adevical in November 2006, remaining section consist of arch argments only (placed on a well plate supported by in-place limber posts) Low-stringth concrete was used to backfit area tolwwon and behind steel seris. Rockbotts	tolon - limber sets were sholdreise during repairs in November ere installed in crown and safewalls north of caved infollepsed area			s spaced 15% dry in general: the east 1/s arch segment of the at around Sta 3+43 fet into the burnet on 01/16/2/00?	Rotting turnber solst, sp. 1-2 ft, shopered, offset joints, west - a turnber set fell into the fill turnnel on 07/05/2007 et approximately Sta 3+28		Tember sets in law condition, dry	avy dropping	1.2 ft fair to good condition, dry	R crushed and crecked jornis	115 it, fair conducts, wet slight detendration	PRINCIPLICA PRINCIPLA PRINCIPLA		April Portal @ MP 720 73	
	Sector may require more shotceste besteen me existing timber sets for completion - or named in additional rackboirs and a 4" thick application of shotcesta	Remove timber sets and legging and retail ruckbolts frow- sparing 5 feet ear 14 long ruckbolts per row) and apply 4*-finck sales liber reinforced shotcrets	Remove limber sets and legging and install rockboils (row- spacing 5 feet, ten to theiro 17-long rockboils por row) and sppty 4"-thick steel fiber nerivo of 17-long rockboils. The construction of the new liner may require the use of steel satis for temporary and permanent support also, due to the wel condition of the area backflang of the seas with concretio or shockrate maybo required released of applying shotcrete. Prior to construction, the draking of probe holes maybe required in order to obtain informebon about the current general ground condition.	Remove ember eats and lagging and retail rockbotts in crown end sidewats (row-specing 5 feet ten 14-long routipots per row) and apply 4"-thick stool fiber removed sholcrate	Remove turber sets and lagging and install noclobits in crown and sidewalls (row spacing 5 feet, lain 14' long noclobits per row) and apply 4"-thick sleet liber remininged shotcrets	fernanet inther ests and legging and estall colclods in crown and salvenils (row-specing 5 feet, ten 14-long mobilets per row) and apply 4"-thick steel fiber reinforced shotcrets	(Current conditions of tember leavage as feet to good generally However lamber will determine over time and mary cause problems in these sections in the father Replacing the lamber leavage with rocklods and steel faber reinforced sholdrefe is recommended in the fature in order to maintein the long-term stability of the turned. Fature repeats should include installation of problods frow-spacing 5 feet, six 12 -long rocklods per row) and application of 4 "thick short fibor reinforced shotorito.)	Remove lumber sets and liagging and install rockbotts in crown and sidewalls (row spacing 5 feet, ten 14-tong rockbotts per row) and apply 4"-thick stind liber munforced shotcrein	Romano amber sos and lagging and instal rockotts in crown and adewals (row specing 5 feet, six 14° long rockbolts per row) and apply 4°-thick steel fiber reinforced sholdrets	Remove traber eats and lagging and install rockbolts in crown and sidewets (row spacing 5 feet, sex 14 long rockbolts per row) and apply 4"-thick steel liber remiscraed shotcrets	remove immoer sets end risgging and restal rockooks in crown and adowals (now-specing 5 feet sus 14-long rocktoits per row) and apply 4"-thick steel fiber residenced shotcrotto				
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Shannon Wilson, Inc

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	11•10	09+88	09+26	08+89 	06+18		05+85		05+74	05+29	05+12	04+86	04•79	04+60	•
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Shotcrate over Steel Sets	Tenhor Sets on Contrete Curb with Tenber Lagging	Sholarëte over Steel Sets on Concrete Curb	on Concrete Curb with Timber Lagging	Timber Sots on Concreto Curb with Timber Lagging	Timber Sets on Concrete Curb with Timber Legging	Shotorete over bedrock	Shatarete over bedrock	Timber Sets on Concrete	Tember Sets on Controls Curb with Tember Laggung	Sinel Sets on Concrete Curb	Timber Sets on Concrote Curb with Timber Lagging	Shoicrete over Steel Sets on Concrete Curb	Timber Sets on Concrete Curb with Timber Lagging	Timber Sate on Concusts Curb with Timber Lagging	Туре
96	2 0	20	10-15	90	1 5-2 0		26	3	-1 G	15	16	40	20	40	Set Spacing, ft
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	c a	ca Ca	6	œ.	æ	: 	a	n	c .	G	Gr.	G	6	6	Height above TOR, IS
Steel ribs spaced 2 ft covered with shotcrete dry	Wood ribs sp 2 ft, good condition dry sand deposits at lose of posts at Sta 11+25	ed with shottered manor dreps scattered masking shotteres in erch	minde peer and stad of year 15,000. Old shift our tending forms at stad	I Z Deced Z II	crushed Out Joins, run sees serps in arch, nenging segments	Timber sets were removed and roplaced with shotcrote and nockbolts	Timber sets were removed and replaced with shotcrete and recibalis	Rotted timber and crushed but! joints,	Timber sets, spaced 1 Sr., with polyurathane grout. Sandstore exposed in 1/4 erch	d	d crushed butt joints. Bowed sots along east sidewall wore reinforced cently.	Caved area up ~15 it (est 10 to 15 cy of rock fall material) - Section was stabilized in November 2006 with "wo steel sets speced at 4 feet steel channel legging was installed and arches and crown were backfilled with shotcrote	ts nummerous offsets, poor condition - Timber sets were partuely events during repairs in November 2006 Rockbots were instelled in sers	onghushasi cracks in several limbers - I ember sets were shotorelad Movember 2006, Rockbolts were installed in Crown and autowals	
	Current conditions of Infebor fung is five to good generally However triber will determine over time and may cause problems in these sections in the future. Respiciong the timber sinuig with rockbotts and shoul fiber reinforchd schicloste is recommended in the future in order to maintain the long-term stability of the turnol. Future repers should include institution of rockbotts (row-upacing 5 feet fiber 12 -lang rockbotts per row) and application of 4"-thick shoul fiber reinfurced sholcrete.		place 4"-thuck sholcrofe over reposed ground and be steel sets into sholcrofe application	Current conditions of timber aming at less to good generally flowerer timber will deformable over timbe and may cessed problems in these sections in the future Replacing the timber intermit month mockboits and sirvil fiber reinforced sholcrete is mociomended in the future in order to maintain the burg-term stabetry of the turnel Future repers should include installation of problems from a 12-burg recisholts per rain application of 4"-thick stoel fiber reinfurchd sholcrete and application of 4"-thick stoel fiber reinfurchd sholcrete.	resmove imag, insulinacions (the special) area, resilivo in each sidewall - 12-long rockbolts por row), and apply 4" thick steel fiber reinforced shotches			Two terribor sets were left in place, because they appeared to be tight whon attempted to be removed during rocard repair works. However tember will defective over time and may cause problems in these sections in the future. Amplicing the timber learning with rockbolits and stool fiber reinformed shotcinite is recommended in the future in order to mainten the timp-term escaramended in the future repairs should include installation of stability of the turners! I dure repairs should include installation of rockbolits (row-specing 5 feet, five 12*-long rockbolits per row) and application of 4*-thick steel fiber reinforced shotcines.	Current condition of limber kineg is fair to good generary Current condition will definitional over limb and may cause problems in these socious in the future. Replacing the birder kining with rockbotts and steel fiber reinforced sholcrele is recommended in the future in order to mention the long-form stability of the future! Future impers should include installation of rockbotts (row-specing 5 heet, six 12'-long rockbotts per rowl) and application of 4"-thick stool fiber reinforced shotcreto	For lang-term stability numore timber lagging behind steel sets enul apply 4"-thick shotcrete over exposed ground between ants	Remove timber lining install rockbolts (row-specing 5 feet leght to linn - two rockbolts on each adjowell - 12" dong rockbolts por row), and apply 4"-thick stock fiber removed shotorate		Section may require more shotcrete between the oxisting timber sets for completion: or namove current lawy, and replace with additional rackbotts and a 4" thick application of shotcrate.	Section may require more sholdrerie between the austing lambor ands for comprishors or romove current leung and replace with a 4" thick application of shortrete	
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	122	<u> </u>	37		33		H				&				Ŀ
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	-10 % of wood focang blocks are rotted & crushed was sub - downgraded to 62 Repair Lavel 4	<u> </u>	ષ્ઠ	<u> </u>	<u> </u> 👼	Ĺ	ı				5				# 12.00 mm

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Table 4

ODOT RAIL STUDY TUNNEL 15

Coos Bay Subdivision, Oregon MP 720.73 to 720.14

13+28

13+90 13+28

20 20

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Good wood ents dry, speced 2 ft

12±85

14+34

13+90

Timber Sets on Concrete
Curb with Timber Lagging
Speal Sets and Timber Sets
on Concrete Curb with
Timber Lagging

10-15

Good wood sets dry, spaced 2 ft

Station To

Length, ft

Repair Level

Ϋ́

Set Spacing, ft Y/N Height above TOR, in

Good wood sets dry spaced 2 ft

No Rome LF Nº Sy

Congress

Timber Sets Continuents

1 No 9/12/08 Visit

Siest ribs spaced 2 ft covered with shoicrete local drips scatbrod missing shoicrete in arch. Siest ribs spaced 1 5 to 2 ft covered with shoicrete abundant drips, missing shoicrete in arch locally. Sleel jump sets ipoor wood sets, lost 2 sections. Another trabhe sot fall out on 11/17/2006 at approximataly Sta 14+41 Sed- and (possibly) wood ribs, spaced 1 ft, covored with shotcrete itoel ribs spaced 2 ft, covered with shotcrate dry eto shoicrele application

Current conditions of immer known is fair to good generally.

However tember will detonorate over lime and may cause problems in these sections in the fature. Replacing the tember liming with recibidits and sized fiber revidenced sholtcrete is recommended in the fature in outer to mention the bring-form stability of the turner! Future repairs ahould include matification of recibidits (row apacing 5 feet their 12-long recibidits per row) and application of 4-thick street fiber revidenced shortcretic. Current conditions of imber from as fas to good generally However, lamber will detendrate over time and may cause problems in these sections in the future. Replacing the timber learny with rockbotts and steel fiber reinforced sholicitin is recommended in the future in order to member the long-torm stebility of the future. Future repeats about include natioalistics of rockbotts (row-spacing 5 feet five 12-long rockbotts per row) and application of 4"-linck steel fiber reinforced sholicities. Current conditions of trainer leving is for to good generally However trainer and deteriorate over time and may cause problems in these sections in the future. Replacing the trainer problems in these sections in the future. Replacing the trainer with rocklods and steel filter reinforced abolizable is recommended in the future repeats should include natialisable of the trainer Future repeats should include natialisable of collabolity (row spacing 5 level, five 12-long rocklodits per row) and application of 4"-thick steel fiber reinforced shotcrefe. Roper spatiod shottrets in crown and norwass general shickness of shottrets in crown (around 2 niches). Reper spatied shottrets in crown and norwaso general shickness of shottrets in crown (around 2 niches). Remavo lambar sots and lamber lagging between steel jump sets sleae 4"-thick shokarate over exposed ground and the stock sots Support sidewalls of concretts barrel with rockbotts, 1 2 nove on such side at a 5 spacing, bolt length estimated to be 12 feet minimum. Indeal work may require probe holes to determine sectioness of concrete and depth to competent bedrock.

8318

1/4 cy rock la1 through hole in arch at 19+80

Lower 6" - 24" of several tember ribs are well and rotting -downgraded to D Repair Level 4

18+95

20+80

16±61 15+85 14+47

18+95

<u>\$</u> 16+81

Timbor Sets on Concrete
Curb with Timber Lagging
Shotcrete over Steel (and
Timbor) Sets
Shotcrete over Steel Sets
on Concrete Curb

20 10

Shoicrete over Steel Sets on Concrete Curb

1520

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20

pair Lovol 4 (ft.) 607	Est Total Stool Sots (No.)	6](Est Unit Rates \$5300/per set)	Est. Total Construction Costa	\$31,800
Level 4 5 (ft) 66	Est Total Rockbolts (LF)	2600 (Est Unit Rates \$85/per LF)	Est Total Construction Costs	\$221 000
	Est Total Concrete (cy)	0 (Est Unit Rates \$110/por CY)	Est Total Construction Costs	8
	Est Total Sholoreto (cy)	84 (Fst Unit Rates \$1000/per CY)	Est Total Construction Costs	\$84,000
aval	Est Total Timber Sets (No.)	72 (Est Removel Unit Rate \$1600/per set)	Lst Total Removal Costs	\$114 667
Repeats should be completed immediately to <6 months		Est Sub Total	Est Sub Total for Level 1 and 2 (md Level 2-3) Reparts \$451,487	\$451,487
Repara should be completed in 0 to 12 months			Mobilzation (15%) \$67 720	\$67 720
Repairs should be completed in 12 - 30 months			Contingency (20%) \$90,293	\$90,293
Repairs should be completed in 30 - 48 months		Est Total of Lovel 1	Total of Level 1 and 2 (incl. Level 2-3) Construction Cost. \$609,480	\$609,480
No immediate repairs required based on the current conditions				
	COST ESTIMATE FOR REPAIR LEVELS 1 TO 5	LEVELS 1 TO 5		
	Eat Total Steel Sets (No.)	6 (Est Und Rates \$5300/per set)	Esi Total Construction Costs	008'165
	Est Total Rockbotts (LF)	9914 (Est Und Raics \$85/per LF)	Esi Tolai Construction Costs	\$942 690
	Est.Total Concrote (cy)	0 (Est.Unit Rates \$110/per CY)	Est Total Construction Costs	8
	Est Total Shotcreto (cy)	624 (Est.Unit Rates \$1000/per CY)	Est Total Construction Costs	\$624 000
	Est Toles Timber Sets (No.)	346 (Est Removal Unit Rate \$1600/por set)	Est Total Removal Costs	\$552 800
			Fst Sub Total for Ropairs \$2,051 290	\$2,051 290
			Mobilization (15%) \$307,694	\$307,694
			Contangency (20%) \$410,258	\$410,258
			EST TOTAL OF THE PROPERTY OF T	767'60! 76

2143 12 80 74 607 66 COST ESTIMATE FOR REPAIR LEVELS 1 to 2 zz

24 1-03505-002 ODOT Rail Study Coos Bay Tunnel 15

ODOT RAIL STUDY TUNNEL 16

MP 721.52 to 721.64	Coos Bay Subdivision, Oregon
	_

Type Set Specing, R VM Height above TOR. In Concrete Dame Concrete Portal © MP 721 52 Concrete Dame Concrete Barnel Concrete Dame Set Specing, R VM Height above TOR. In Concrete Dame Scattered creak a parrel crown Scattered drys in crown Set Specing and creak above west adental room Scattered drys in crown Set Specing on crown Set Specing and Concrete Dame In		5+78	5+52	5+00	4+86	4+58	4+43	4+10		£		0+00	From	Sis
Concrete Parall Concrete Parall Concrete Dames Concrete Dam	I3 6+33 Total Length (ft) Iper Level 5 (ft)	6+33	5+78	5+52	5+00	4+86	4+56	443	4-10	Š		95	70	Station
Type Set Seaching ft V/M Height above 10R in Month Portal <u>All MP 721 92</u> Concrete Partal Concrete Partal		•	26	£	14	36	13	ا يو	ŝ	 g 		0		Length, 1
Set Specing, ft. V/W. Height above TOR, in Worth Portal @ HP 721 52 Concroto barrel Scalared Conda in barrel drown Scalared dry an crown														Repair Level
V/W Height above 10R. In Prof. Scattered Charles an barrel crown Scattered firsts in cown Scattered Charles and Scattered Charles and Scattered Charles in Cown Scattered Charles in Cown Scattered Charles in Cown Scattered Charles in Cown Charles in Cown and Scattered Charles in Charles	Concrete Portar	Concrete Barrel	Sholcrete over Steel Sets	Shoicrelo over Steel Sots	Sholcrele over Steel Sats	Shotcrete over Steel Sets	Shotcrete over Steel Sets	Shotcrete over Steel Sals	Shotuele over Steel Sets	Concrete Barrel		Concrete Portal	Туре	Build
V/NI Height above 10R. In Prof. SQ MP 721 52 Convoire brank Scatamed crack as barrel crown Scatamed drays in cown Scatamed Convoire brank Scatamed Scatamed drays in cown Scatamed Convoire brank Scatamed Scatamed Brank Convoire Scatamed Convoire S			25	25	25	25	25	25	N U				Set Spacing, ft	
TOR. In Partial (1) July 721 52. Rend Portial (1) July 721 54			~	4	4	۲	 	√	≺				ΥN	
North Portal <u>80</u> MP 721 S2 Concrete barrel Scalabord cracks in barrel crown Scalabored dirps in crown - %-% open crack on east addwell and % open crack on work wall at Sta 0+10 - Honcornial crack along west addwell from Sta 0+11 to 0+55, offset in places up to 3%. - Honcornial crack was pear along seat selewell from 0+11 to 0+55 offset in places up to 3%. - Honcornial crack was pear along seat selewell from 0+11 to 0+55 offset in places up to 3%. - Durp near contribution of crown between Sta 1+21 and 1+33. - Durp spot on west selection of crown at Sta 4+00. - Seepage in crown with dropping locally and cratigle discolaration. - Dy Orenge discolaration along conter line of crown in Sta 3+03. - Durp spot on west selection of crown along conter line of crown in Sta 5+01. - Heavy dropping along west springline bitween Sta 5+11. - Heavy dropping and descolaration at Sta 5+11. - Heavy dropping and descolaration at Sta 5+11. - Heavy dropping and descolaration at Sta 5+11. - Heavy dropping and descolaration at Sta 5+11. - Heavy dropping and descolaration at Sta 5+11. - Heavy dropping and descolaration at Sta 5+11. - Heavy dropping and descolaration at Sta 5+11. - Heavy dropping and descolaration at Sta 5+12 and 5+57. Flowing settle above springline bitween Sta 5+12 and 5+57. Flowing settle above springline bitween Sta 5+12 and 5+57. Flowing settle above springline bitween Sta 5+144. - Concrete barrel Demp with local dropping - Flowing weller above springline bitween Sta 5+44 and 5+52. - South Portal Q NF 721 64.			 	 	 	6	 	 	on.			 	Height above TOR, in	Concrete Curb
Total 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	sth Portal @ MP /21 64	ncrete berrol Damp with local dripping owing water above springling in wast sidewall at Sta 5+84 and 5+92,	avy dripping along west springline between Sta 5+52 and 5+57, F or at contact of eloel sets and concrete barrel	mmittent cracking in sholorabia application along center line of sepage at west springline at Sta 5+04 servy dripping and discoloration at Sta 5+11,	Orange discoloration	spage in crown with dripping locally and white to orange disc		spage in crown with droping locally and orange discolorate	otcrete over steel sets et 2.5'-spacing on concrete curb, inps noar center line of crown between Sta 1+21 and 1+33 amp with discoloration along center line of crown at Sta 3+ 13+83		n. Will be possible details and % open crack on w 19+10 on.contail crack along west selewall from Sta 0+11 to 0+55 cos up to %, on.contail crack % open along east selewall from 0+11 to 1	rth Portal @ MP 721 52		Comments
Roms From	-	<u> </u>	grawo	crown		oloration		*	and ex	 	ost wall et , offset in >55 other			
		 	Drawing	COMM		pioration		5	and et		ost wall at offset in P-55 other			RAPEZ
	П	 	Dawoi	COMM		pioration			and et		ost wall at out of the control of th			
		 	lowing	COMM		pibration			and et		ost well at out of the control of th		7 8	0.000 0.000
	0		Danag	COMM		nodebon :			and et		ost well at out of the control of th		↑ No Rown 5	OTHER DESCRIPTION
	0		lowing	COMM		bioration			and et		ost well at one of the control of th		7 No Rosen 5 7	OTHER DESCRIPTION
	0 0 0 0 0		lowning	COMM		Dioreiton			and et		ost well at one of the control of th		the No Rooms II the Cy the	OTHER DESCRIPTION

	8	ne amedia tot mon one 183			
	5	Take Take to Committee			
	8	Eși Total Removal Costs	0 (Est Removal Unit Rate \$1600/por sot)	0	Est Total Turber Sets (No)
 	1 8	Est Total Construction Costs	(Est Unit Rates \$1000/per CY)		Est Total Shotcrete (cy)
	1 8	Est Total Construction Costs	(Est Unit Ratos \$110/per CY)		Est Total Concrete (cy)
i '	8	Est Total Construction Costs	(Est Unit Rates \$85/per LF)	 -	Est Total Rockbofts (LF)
	 -	Est Total Construction Costs)(Est Unit Rates \$5300/por set)	<u>. </u>	Est Total Steel Sets (No.)
				NR LEVELS 1 TO 5	COST ESTIMATE FOR REP

Repair Level
Repears should be completed inwhedistry to <6 months
Repears should be completed in 0 to 12 months
Repairs should be completed in 12 - 30 months
Repairs should be completed in 30 - 48 months
No immediate repairs required based on the current conditions

Mobilization (15%) \$0 Contingency (20%) \$0 Est Total of Construction Cost \$0

ODOT RAIL STUDY TUNNEL 17 Coos Bay Subdivision, Oregon MP 727.70 to 727.83

Shannon Wilson Inc

heabon is heabon is lead drops. It is of tent drops		Z	Blocks with Timber Lagging	72	7+80 8+52
(Current conclutions of immbar laring and wood front blocks are laring programs); However, in these wall determinate over laring regions and productions of the state of pool generally. However, in these wall determinate over laring and may consep positions in the state of pool generally and coabbits and lates of the further instance of market states and coabbit port only and application of 4"-thick state filter market states of the further instance of market states and coabbit port only and application of 4"-thick state filter market states of the further instance of the furt			Timber Sels on Wood Foot		
Common conditions of inmittee lump and record "rote blocks are fair to good penesity" (squeener under what disconnant over fair to good penesity) (squeener under what disconnant over fair to good penesity) (squeener under what disconnant over fair to good penesity) (squeener under what disconnant over fair to good penesity) (squeener under what disconnant over fair to good penesity) (squeener under what disconnant over fair to good penesity) (squeener under what disconnant over fair to good penesity) (squeener under disconnant over fair to good penesity) (squeener under disconnant over fair to good penesity) (squeener under what disconnant over fair to good penesity) (squeener under what disconnant over fair to good penesity) (squeener under what disconnant over fair to good penesity) (squeener under what disconnant over fair to good penesity) (squeener under what disconnant over fair to good penesity) (squeener under what disconnant over fair to good penesity) (squeener under what disconnant over fair to good penesity) (squeener under what disconnant over fair to good penesity) (squeener under what disconnant over fair to good penesity) (squeener under what disconnant over fair to good penesity) (squeener under what disconnant over fair to good penesity) (squeener under what disconnant over fair to good penesity) (squeener under the fair of good shockes as continued and continued to good shockes as continued and continued to good shockes aso					
(Current conclutions of lumber furing and wood foot blocks are tarn to good generally. However, lumber will discoverate over tarn and offer any studies problems in these seadonts in the fixth future of the foot and the foot seadonts of the fixth future of the fixth future of the foot seadonts of the fixth future of the fi		z	Timbor Sets on Wood Foot Blocks with Timber Legging	ฉี	7+88 7+80
(Current conditions of lember lungs and wood 'oot blocks are lare to good generally. However lumber will discovered in the lare of good generally. However lumber will discovered in the lare of the l	gon wood foot blocks with lumber legging legging with debris pifed up 8-12" high behind it, one			-	
(Current conditions of limber lung and wood fool blocks are fair to good generally relevened immer will obscribe account over time and my cases problems in these sections in the fair to good generally relevened immer will obscribe account over time and my cases in secon-mercial in the faur in order to market in the largy are recorded shockers in secon-mercial in the faur in order to market in the largy and application of 4" think should market immigration of recitorities (rev-specing 5 feet, free 12" long recitorities per revi). Remove limiter sets and rotated timber lagging and clean serul international timber language and dean serul international timber language and dean serul international timber language and dean serul international timber language and experience on the fair to good generally thewever timber and discontinual ones. (Current conditions of immiss timp and wood fool blocks are later to good generally the house of the fair to good personally the brass addrons in the fair to good generally the house of the fair to good generally theorems and discontinual to the fair to good generally the verse of discontinual to the fair to good generally the verse of discontinual to the fair to good generally the verse of discontinual to the fair to good generally the verse of discontinual to the fair to good generally to the surreof Fairer regions. 5 to discontinual time of the fair to good generally the fair to good generally the condition of the fair fair to good generally the fair to good generally the condition of the fair fair to good generally the fair to good generally the fair to good generally the fair to good generally the fair to good generally the general discontinual to good generally the general discontinual to good generally the general discontinual to good generally the general to good generally the general general to good generally the general general general generally the general general general general general general general general general general general general general general general	ire in fair to good condition generally, Tracks are in totally sunk in wet mud, sagging (fowered?) brack at	z	Timber Sets on Wood Foot Blocks with Timber Legging	39	7+29 7+88
(Current conditions of limber lining and wood foot blocks are fair to good generally. However limber will determable over time and may case problems in these seations in the future repairs time a recommended in the future in order to mentioned stockers is recommended in the future in order to mentioned stockers in recommended in the future in order to mentioned stockers are recommended in the future in order to mentioned stockers are resourced and in the future in order to mentioned stockers are for specially in the sapprage and clean seat from rock debries. In 12 - long problems of mentioned and wood foot blocks are fine 12 - long problems of seat of worders. Remove limber seat and rotted limber largering and clean seat from rock debries. Remove limber seat and rotted limber largering and clean seat from rock debries. Remove limber seat and rotted limber largering and wood foot blocks are fair to good generally However timber will determable over time and may cause problems in these sections in the future in order to limber largery with nockoths and stoof floor limber largery with nockoths and stoof floor limber largery with nockoths and stoof floor limber largery with nockoths and stoof floor limber largery with nockoths and stoof floor limber largery with nockoths and stoof floor limber largery with nockoths and stoof floor limber largery with nockoths and stoof floor limber largery with nockoths and stoof floor limber largery with nockoths and stoof floor limber largery with nockoths and stoof floor limber largery with nockoths and stoof floor limber largery with nockoths and stoof floor limber largery with nockoths.		*	Curb with Timber Lagging	8	6+44 7+29
(Current condutors of limber luring and wood 'oot blocks are fair to good generally. However lumber will disconrate or over time and may cause problems in the future replaces the subscriber an experimental state of the tument. Future replaces the problems in the future replaces the problems and state of the tument. Future replaces should include installation of rodolotis (row-spacing 5 leet, five 12-long problems per row) and application of 4 flunck states filter entiroided shorterolo. Remove inform code debris. Remove inform code debris. Remove information for direction in the future of the filter in problems in the future of the filter in problems in the filter or response of a makes. Lange information for the filter in the filter or response of a makes. Lange filter entiroided theorems of a makes. Lange filter and condition for an after state of the filter in problems in the filter or response in the filter in the fil		Z	Blocks with Turber Legging Turber Sats on Concrete	49	5+85 6+44
(Current conditions of limber luring and wood 'not blocks are fair to good generally. However limber with distinction over time and may cause problems in these seatons in the future repairs restricted shotcrets is recommended in the future repairs restricted shotcrets is recommended in the future repairs should include installation of rockboths (now-spacing 5 feet, five 12-long rockboths per row) and application of 4*-limbk steel filter remarked shotcrets in the spacing, the 12-long rockboth per coal and splication of 4*-limbk steel filter remarked shotcrets. Remove limber sets and rotted limber lagging and clean area from nock determined the conditions of 4*-limbk steel filter remarked the conditions of 4*-limbk steel filter remarked the conditions of 4*-limbk steel filter remarked the conditions of 4*-limbk steel filter remarked to the desired the conditions of 4*-limbk steel filter remarked to the desired the conditions of 4*-limbk steel filter remarked to the desired the conditions of 4*-limbk steel filter remarked to the desired the conditions of 4*-limbk steel filter remarked to the desired the conditions of 4*-limbk steel filter remarked to the desired the conditions of 4*-limbk steel filter remarked to the desired the conditions of 4*-limbk steel filter remarked to the desired the conditions of 4*-limbk steel filter remarked to the desired the conditions of 4*-limbk steel filter remarked to the conditions of 4*-limbk steel filter remarked to the conditions of 4*-limbk steel filter remarked to the conditions of 4*-limbk steel filter remarked to the conditions of 4*-limbk steel filter remarked to the conditions of 4*-limbk steel filter remarked to the conditions of 4*-limbk steel filter remarked to the conditions of 4*-limbk steel filter remarked to the conditions of 4*-limbk steel filter remarked to the conditions of 4*-limbk steel filter remarked to the conditions of 4*-limbk steel filter remarked to the conditions of 4*-limbk steel filter remarked to the conditions of 4*-limbk steel filter remarked to			Tamber Sals on Wood Foot		
(Current conditions of limber luring and vecod 'not blocks are fair to good generally. However limber and determine over time and may cause problems in these sections in the future repairs represented the teamer Future repairs. Replacing the similar represented in the future repairs should include installation of rockotis (now-spacing 5 feet, five 12-long rockotis per row) and application of 4"-thick steel fiber remitted shorted in the future repairs should include an advantage of the second rocket in the fiber remitted shorted in the fiber		2	Blocks with Tumber Legging	5	5+80 5+95
(Current conditions of limber thing and wood foot blocks are fair to good generally. However limber will dolicinorate over time and may cause problems in these sections in the Otture time and may cause problems in these sections in the Otture over time and may cause problems in these sections in the Otture over time and may cause problems will noduboits and stool floor reinforced shockness in recommended in the future in order to maintain the long-term stability of the tunnel Future or repears should include instillation of rockboths (now-specing 5 feet, five 12-long rockboths per row) and application of 4"-thick steel filter reinforced shockness.	ally, Lagging fell chand lagging.				
(Current conditions of limber lung and wood 'oot blocks are fair to good generally However lumber will deteriorate over time and may cause problems in these sections in the future Replacing the limber limber will notabolis and stool fibor. Replacing the section in order to mention the forgrams stabule of the Lunes (Future repears should include installation of rocktodist (row-spacing 5 feet.		ž	Timber Sets on Wood Fool Blocks with Timber Lagging	120	4+60 5+80
(Current conditions of lumber laring and wood foot blocks are fair to good generally. However lumber will deteriorate over fair to good generally researched in these sections in the fature or norder to reminded in the future or norder to reminded in the future or norder to reminded and sections or a section of the reminded in the future or norder to reminded and sections or the future or norder to reminded and sections or the future or norder to reminded and sections or the future or norder to reminded and sections.					
(Current conditions of limber luring and wood 'tool blocks are fair to good generally However limber will deteriorate over the and may cause problems in these sections in the fair to good se		- - - -	Curb with Timbor Lagging_	Ça	4+52 4+60
			Timbor Sats on Concreto		
		\ \	Shotcrete over Steel Sets	23	4+29 4+52
Ny 69 <	Shokarete over stock sets at 4" spacing on concrete curp, informass or application is between 4" and 6", thinner in crown generally, Dry	~	Shokarele over Sleei Sets	64	3+65 4+29
	Shouters over seen sets at 4" spacing on contrain cuts, intertiess of application is between 4" and 6", thinner or crown generally.	2 γ	Shotcrate over Stool Scts	26	3+39 3+65
∑ G <	5 In become visible between Sta 2+50 and 2+60	 	Shotcrata over Stool Sats	94	2+45 3+39
hy 62 <	Shukareta over steel sets at 4 - spacing on concroto curb, Thickness of application is between 4" and 6", thinner in crown generally, Scattered drips,				
Z G <	application to between 3° end 8°, therefore in cover generally. Abundant drips, shotchele is discolored at many locations funned dries up around Sta 2+30 ggnorally. Very muddy track	Y	Shotzete over Steel Sets	102	1+432+45
Z-2	continuos over sees esta in terror epocaty of content over, replacement is relatively than (-4"-thick). Existing terror broken lagging was covered with shotcrute possibly. Track is sunt in mud. Flowing water from X-arch on E-scawall (est 5-10 galiman) at Sta 1+39.	 	Shalcrata gyer Steel Sets	ii ii	1+28 1+43
	- Crack in E-sidewall at Sta 0+52 Crack in W-sidewall at Sta 0+57 Crack in W-sidewall at Sta 0+57 Crack at center line of crown from -Sta 0+72 to 1+28 Ditches along both eides are filled with silt and gravel depth driches approver to be at least 10" below rail		Concroto Barrol	128	0+00 1+28
th Portal @ MP 727 70	OZ	•	ortal	0	00-0 00-0
th No Rows LF IV Sy It S		Set Specing, R Y/N Height at			From To

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ODOT RAIL STUDY TUNNEL 17 Coos Bay Subdivision, Oregon MP 727.70 to 727.83

Repair Level		Repair L	Repair Lovel 4-5 (ft	RoperL	Reper L	Total	12+00	11+45	10+54		9+03		8+69	8+52					From	Station
		Repair Level 5 (ft)	vel 4-5 (ft)	Repair Level 4 (ft)	Reper Level 3 (ft)	Total Length (ft.)	12+00	12•00	11+45		10+54		9+03	8+69					То	ō,
		1156	15	12	17_	0021	0	5	91		151		34	17						Length, ft
				55										3						Repair Level
			la				Concrete Portal	Concreto Barrel	Sholcrato over Steel Sets		Shotcreto over Bodrock		Shokrete over Bedrock	Blocks with Timber Lagging	Timber Sets on Wood Foot				Type	Lining
Est Total Concrete (cy)	Est Total Rockbolts (LF)	Est Total Steel Sets (No.)	COST ESTIMATE FOR REPAIR LEVELS 1 TO 5						2					4					Set Specing, ft	
<u>§</u>	5	8 (No.)	FOR REPAI						4		4		z	z					MA	C
0	480	0	R LEVELS 1 TO 5						12		. 12								Height above TOR, in	Concreto Curb
(Est Unit Rates \$110/per CY) Est Total Construction Costs	(Est Unit Raies \$85/per LF) Est Total Construction Costs	(Est Unit Railes \$5300/per set) Est Total Construction Costs					South Portal @ MP 727 63	Concrete barrel. Seepage in crown at contact of barrel and steel sets	Drup et Sta 11+10	Shaltareto over sloci sets on concrete curb at 2'-specing	Track appears to be lowered in this section	Shokareto over bedrock concrete ourb is present along both sides of tunnel,	Shokcrete over bedrock Dry			tool blocks are crushed. Bedrock appears to be close behind lagging	section sagged 12 inches wood boards wore used to strap sets together	Tember sets at 4'-spacing on wood loot blocks with tember legging, Entire		Comments
8	\$40 800	8				Total								- Apply shokarete to the desired thickness of 4 inches	rockbatis per row),	 Install reckbolts (reckbolt rows at 5'-spacing, five 12'-long) 	rock debns,	Remove limber sets and timber logging and clean area from		Repairs
						٥	-		<u> </u> 		<u></u>								.⇒ 8	Steel Sets
						٥	-	<u> </u>			<u> </u>		<u> </u>	,.			_		Town	
						480	L	 -	_		_			180					Ş	citbolts
						3168	-		Ī	_	_			1224					ą	Shotcrate
						8		 - 					<u> </u> -	<u>5</u>					<u>*</u>	_
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1				
rLovel 4-5 (ft) 15	COST ESTIMATE FOR REPAIR LEVELS 1 TO 5	LEVELS 1 TO 5		
er Level 5 (ft.) 1156	Est Total Steel Sets (No.)	O((Esi Unit Rains \$5300/per set)	Est Total Construction Costs	\$0
	Est Total Rockbolts (LF)	480 (Est Unit Rates \$85/per LF)	Est Total Construction Costs	\$40 800
NA.	Est Total Concrete (cy)	0 (Est Unit Rates \$110/per CY)	Est Total Construction Costs	\$6
Repairs should be completed immediately to <6 months	Est Total Shotcrete (cy)	38 (Est Unit Rates \$1000/per CY)	Est Total Construction Costs	\$38 000
Ropeirs should be completed in 0 to 12 months	Est Total Timber Sets (No.)	14 (Est Removal Unit Rate \$1600/per set)	Est Total Removal Costs	\$22,400
Repairs should be completed in 12 - 30 months			Est Sub Total for Repairs \$101,200	\$101,200
Repairs should be completed in 30 - 48 months			Mobilization (15%) \$15,180	\$15,180
No immediate repairs required based on the current conditions			Contingency (20%) \$20,240	\$20,240
			Est Tale of Consistent Cost \$138 630	#136 G20

Mobal zahon (15%) \$15,180 Contingency (20%) \$20,240 Est Total of Construction Cost \$136 620

24-1-03505-002 ODOT Rail Study Coos Bay Tunnol 17

ODOT RAIL STUDY TUNNEL 18 Coos Bay Subdivision, Oregon MP 734.48 to 734.77

Shannon Wilson Inc

12+60	11+10	9+60 10+78 118	9+60	9+22 9+36 14	9+05 9+22 17		4+12 8+94 282	4+12	4+00	0+00 0+00 0		From To
CS:		(5:		TS:					le-	10		Repair Level
Timber Sels on Wood Foot Blocks with Timber Legging	Timber Sets on Wood Foot Blocks with Timbor Legging	Timber Sots on Wood Foot Blacks with Timber Legging	Timbor Sals on Wood Foot Blocks with Timbor Legging	Timber Sets on Wood Foot Blacks with Timber Legging	Timbor Sots on Wood Foot Blocks with Timbor Legging	Shotcrete over Steel Sets	Shokarete over Steel Sats	Shokrete over Steel Sets	Shoicrete over Steel Sets	Shotcrete over Steel Sets		Type
•	•		•	•		_	N	4	4	2 2		Set Specing, ft
z	z	z	z	z	z	۲	≺	۲	۲	۷ <		¥¥.
						<u>. </u>	0 and 6		' ! !	ನ ನ	_	Height above TOR, in
Bottom of limber posts and/or wood footing blocks are severely deteriorated show signs of crushing squeezing, and/or shriting and/or ere cracked. Sagged posts on east side between Sta 11+10 and 12+00 sagged posts on west side between Sta 11+00 and 11+20, Sta 11+72 and 11+76, and Sta 12+72 and 12+80) - Fouled track, shoulder heaving from Sta 11+20 to 12+30	nto tunnel by at top of ht behind		ber pasts endfor wood footing blocks show initial stages of but do not show signs of edvancod distress or movoment	ber poets anction wood roosing blocks are soverery how aigns of crustway, squoezing, and/or shifting, and/or aro sagging by 6" to 12" along east wall	er posts endor wood roowing proces show mice suages or as do not show signs of advanced distress or movement	Shoicrele over Stael Sets at 2'-specing on concrete curb Shotcrete -6"-8"-thick over steel sets, Dry - Abrupt change in ourb height, lowered 6" at Sta 7+00	Strautelle over steel sets at 2-specing on concrete cure candidate to thick over steel sets. Dry generally - Crack along center lane of crown between Ste 5+70 and 6+30 drop from existing drain in crown setseant to crack at Ste 5+82 - Abrupt change in curb height, raised 6" at Ste 5+84 - Fouled tracks	Shotcrete over Steel Sets at 4*-specing on concrete curb. Shotcrete -6* thick over steel sots, Dry. Gradual change in ourb hoght bogaring at the North Portal (12" above TOR to 0" above TOR)	Shotcrete over Stool Sets at 4"-specing on concrete curb. Shotcrete -6" thick over steel sets. Dry	Shotcreto over Stoel Sets at 2*-specing on concrete curb, Shotcrete -6** thick over steel sets Dry	North Portal @ Sta 734 48	Consulation
Cutting and removal of detenorated wood toding blocks and critical bottom sections of limitor posts. Establish new fooling for timber sets with shotzeste on bedrock or a manufaction of 2 ft below top of rail. whichever is shallower OR Remove existing limiter lining. Install rockbolts (row-spacing 5 foot, five 12'-long rockbolts por row) and apply 4"-thick stool fiber reinforced shotcests).	Removal of six existing timber sets (or shifted posts), installation of six replacement steel sets, installation of receivable rows at 5'-spacing, six 15-ing includes per row). Application of shotcrete to the desired thickness of 6'. Footing blocks and bottom of posts of the two sets to the south of the failed area need to be cut and removed, and then replaced with shotcrete along the oest ade	Culting and removal of deteriorated wood footing blocks and rotted bottom sections of timber posts. Establish now footing for inribor sets with effoctore on bodneck or a mawrum of 2 it below top of rail whichovor is shallower. OR Nemovo axisting lambor lining install rockbolts (row-spacing 5 feet five 15 long rockbolts per row) and apply 6"-thick stock fiber reinforced shotchets).	Replacement of wood footing blocks (and bottom of timber posts when deteriorated). Establish new boting for timbor sets with shotizeto on bedrock or a minimum of 2 ft below top or rail whichever is shallower. OR Remove existing timber liming, install neckbolts (row-spacing 5 feet, five 12'-long rockbolts per row) and apply 4"-thick steel fiber reinforced shoticrote).	culting and removel or operinated wood todaing blocks and rolling blocks and rolled bottom socians of timbor posts. Establish new fooling for lamber saits with shotches on bedrock or a minimum of 2 it below top of rail, whichever is shallower. OR Remove existing lambor lining, install rockbolts (row-spacing Seet five 12'-long rockbolts per row) and apply 4'-thick stock fiber reminorated shotches.	respacement or wood roung proces (and occurs of amount of posts when deteriorated). Establish new fooling for tumber soils with sholeratio on bodirock or a minimum of 2 ft below top or rad, whichever is shellower. OR. Romove conting timber faung, install recibiotis (row-spacing 5 leet, five 12-long rackbotis per row) and apply 4"-thick step if the reinforced sholerate).							repuire
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				<u> </u>				 	Н			R No Roms LF
2040	6 540	24	<u>.</u>	3 98	<u></u> 1			<u> </u>	<u> </u> 			## LF
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	No overall change in funnol promittoria	<u> 31</u>	<u> </u>	los	lu-	!	!	<u>'</u>		Ě	Bailest v dety Ste 0+00 to	9/13/06 Vish

ODOT RAIL STUDY TUNNEL 18 Coos Bay Subdivision, Oregon MP 734.48 to 734.77

Replacement of invoid obtaing blocks (and bottom of unber posts when observed obtained obtaining blocks (and bottom) for limitar sets with shortcritic on bodrock or a minimum of 2 to below top or ras whicheror is shallower. Remove assisting brinder large angular cockbotts (row-sparing 5 feet, five 12 -long rodchotts) per row) and apply 4"-thick, steel five restricted abstracts). Gurrent conditions of trained invoid wood foot blocks are fair to pood generably However, turbor wall determonate over time and may cause problems in these sections in the future sparing the first restricted in the future in the future repairs about their restricted shortcries. Replacement of visit to strain the first part which the first 12-long rodchotts per row) and application of 4"-thick also their restricted shortcries. Replacement of visit of the future of Future repairs should rectify the first of the first first 12-long rodchotts and abstracts (rod-bott restricted shortcries). Replacement of visit of shortcries of the first first 12-long rodchotts per row) and application of 4"-thick five 12-long post to the first first 12-long rodchotts per row) and application of 5" below top or mail whichever is athaltower). Removed of the causing british in the restriction of first or the short restriction of bedrock or a munimum of 2 it below top or mail whichever is athaltower). Removed of shortcries to desend finicionss of 6". Removed of the causing british first first 12-long rodchotts per row) application of shortcries to desend finicionss of 6". Removed of shortcries to desend finicionss of 6". Removed of the causing british first 12-long rodchotts per row). Application of shortcries to desend finicionss of 6". Removed of the causing british first 12-long rodchotts per row). Application of shortcries for the first first 12-long rodchotts for the first 12-long rodchotts for the first 12-long rodchotts for the first 12-long rodchotts for the first 12-long rodchotts for the first 12-long rodchotts for the first 12-long rodch	side shifted into tunnel at the bottom. Rubble and detached lagging and cribbing daught behind posts between Sta 15+20 (imber set is museing at Sta 15+18. Timber legging rotted and y. Some timber sets are specialled at bull ports and from 3. Posts are rotted at the bottom along the east side between of 15+10. By Sta 734 77. By Sta 734 77. Fall Total Construction Costs.	EPAIR LEVELS 1 ANI	GOST ESTRAATE FOR RI	Tember Sets on Concrete Curb with Timber Legging Timber Sets with Tember Legging Concrete Barrel Concrete Portel Concrete Portel Concrete Portel Est Teta	Tember & Curb with Timber & Timber & Con	45 93 102 102 102 102 102 102 102 102 102 102	4+20 14+82 4+20 15+27 15+27 15+80 15+80 15+80 10tel Longth (ft) 9par Level 2 (ft) spar Level 3 - 4 (ft)	14+20 14+82 14+20 14+82 15+27 15+27 15-80 15-80 15-80 16-80 17-80 15-80 17-80 br>15-80 17-80 15-80 17-80
8 480 3024 38 42 42 42 45 40320 538 0 0 0 560	filed into luanel at the hotium. Rubble and detached and cribbing caught behind posts between Sta 15+20 is missing at Sta 15+18. Timber lagging rotted and trimber sets are separated at bull joints and from are rotted at the bottom along the east side between \$4.77	EPAIR LEVELS 1 AND 2	STRAATE FOR R		Timber & Curb with Timber & Curb with Con-		15+80 15+80 15+80 15+80 15+80 15+80 15+80 15+80 15+80 15+80	14+20 14+82 15+27 15+80 150par L
8 480 3024 38 42 42 45 40320 538 0 0 0 580	fied into lunnel at the hotium. Rubble and detached ind cribbing caught behind posts between Sta 15-420. It is masing at Sta 15-48. Timber leaging inted and timber sets are separated at bull joints and from are rotted at the bottom along the east side between.				Tamber & Curb with Timber & Timber & Con		15+27 15+80 16+80 17+80	14+20 14+82 15+82 1509air Li
8 480 3024 38 420 7056 88 98 98 98 98 98 98 98 98 98 98 98 98	Red into lunnel at the bottom. Rubble and detached and cribbing caught behind posts between Sta 15+20 is missing at Sta 15+18. Timber lagging crited and timber sats are separated at butt joints and from are rotted at the bottom along the east side between \$4.77.			rimber Legging Legging ets with Tember Leageng Traise Barrei Legging L	Tamber S Curb with Timber S Con		14+82 15+27 15+80 15+80 15+80 15+80	14+20 15+27 15-80 170tal 1
8 480 3024 38 42 42 4320 7056 88 98 98 98 98 98 98 98 98 98 98 98 98	fied into luanel at the hottum. Rubble and detached and cribbing caught behind posts between Sta 15-20 k is masing at Sta 15-18. Timber lagging rotted and timber sets are separated at bull joints and from are rotted at the bottom along the east side between \$4.77			ots on Concrete Timber Legging His with Timber Agging Trete Barrel Trete Porter	Tember & Curb with Timber & Corbon & Co		14+82 15+27 15+80 15+80	14+20 15+27 15+27
8 480 3024 38 42 42 43 3240 80 - 45 60 60 60 60 580 60 60 60 580 60 60 60 580 60 60 60 580 60 60 60 580 60 60 60 580 60 60 60 580 60 60 60 580 60 60 60 580 60 60 60 580 60 60 60 580 60 60 60 580 60 60 60 580 60 60 60 580 60 60 60 580 60 60 60 580 60 60 60 580 60 60 60 580 60 60 60 580 60 60 60 60 60 60 60 60 60 60 60 60 60	fied into lunnel at the bottom. Rubble and detached ind cribbing caught behind posts between Sta 15+20 k is missing at Sta 15+18. Timber legging rotted and triber sets are separated at bull ports and from are rotted at the bottom along the east side between 477			Timber Legging Timber Legging eits with Timber eits with Timber rete Barrei	Tember & Curb with Timber & Con	62 1580 1580	14+82 15+2/ 15+80 15+80	4+20 5+82 5+85
8 480 3024 20 1200 7056 88 38 - 9 675 3240 60 - 45	Red into tunnel at the bottom. Rubble and detached and cribbing caught behind posts between Sta 15+20 is missing at Sta 15+18. Timber lagging crited and tumber sats are separated at butt joints and from are rotted at the bottom along the east side between 14.77			ois on Concrete Timber Legging eits with Timber ante Barnel trate Portel	Tember S Curb with Timber S	0 2 3 8	14+82 15+80 15+80	4+02 5-80
8 480 3024 20 1200 7056 88 38 - 9 675 3240 60 - 45	fied into tunnel at the bottum. Rubble and detached and cribbing caught behind posts between Sta 15-20 k is masing at Sta 15-18. Timber lagging rotted and timber sets are separated at bull joints and from are rotted at the bottom along the east side between			ots on Concrete Timber Legging ets with Timber Legging rele Barrel	Tember S Curb with Timber S	& & & & & & & & & & & & & & & & & & &	14+82 15+27	4+20 4+82 5+27
20 1200 3024 - 1200 7056 88 38 42 - 9 675 3240 60 - 42	fied into tunnel at the bottom. Rubble and detached ind cribbing caught behind posts between Sta 15+20 k is masing at Sta 15+18. Timber lagging rotted and tunber sets are separated at bull ports and from are rotted at the bottom along the east side between			Timber Legging ets with Timber	Tember & Curb with	8 8 8	14+82	4. 62.
20 1200 3024 20 1200 7056 38	fied into lunnel at the hotium. Rubble and detached and cribbing caught behind posts between Sta 15+20 k is missing at Sta 15+18. Timber lagging rotted and trimber sets are separated at bult joints and from are rotted at the bottom along the cest side between		· * · · ·	Timber Legging	Timber S	, R	14+62	4+20
20 1200 3024 20 1200 7056 88 38				ots on Concrote Timber Legging	Tambor & Curb with	.	4+62	4 28
20 1200 3024 20 7056 88 38				Timber Legging	Tamber &	8 	4+82	4+220
20 1200 7056 88 48 48 48 48 48 48 48 48 48 48 48 48				ots on Concrete Timber Legging	Tember S	& 	14+62	4.20
20 1200 3024 20 1200 7056 88 38				Timber Legging	Tembor &	8 	14+82	4.20
20 1200 7056 88 480 98 42			-	ois on Concrete Timber Legging	Tember &	8	4+82	4.20
8 480 3024 38 42 1200 7056 88 98 98 18 18 18 18 18 18 18 18 18 18 18 18 18			 *	Timber Legging	Tember &	. R	14+62	4.20
8 480 3024 38 42 3024 38 42 42 42 42 42 42 42 42 42 42 42 42 42	<u> </u>		<u> </u>	ots on Concrete	Timbor S	r.	14+62	4.20
99			<u> </u>	ots on Concrete	Tambor &	3	4 4 9 9	.
8 480 3024 38 42 1200 7056 88 98 98				ots on Concrete	Timbor 8			
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8 480 3024 38 	Timber bosts and legiting in less to good contained							
8 480 3024 38 42 20 1200 7056 88 98	and leaves in first to send soudies							j
8 480 3024 38 42	Steel fiber		<u>-</u>	agging	2	88	14+20	13+22
8 480 3024 38	5 Tabit, Trivi			Foot Blocks with Turnbor	Foot Blo			
8 480 3024 38				Tempor ages on sycod	i i i i i i i i i i i i i i i i i i i			
8 480 3024 38 42								
8 480 3024 38 42	between Sta 13+22 and 13+50, and at sta 13+94 OR							
8 480 3024 38 42	sag), end Sta 14+05 and 14+15 (<5-sag). Sagged posts on west side — top or raw							
8 480 3024 38 42								
8 480 3024 38 42								
8 480 3024 38 42	detenorated, show signs of crushing, squeezing landfor shifting, andfor are [posts who					_		
8 480 3024 38 42								
8 480 3024 38 42			_					 -
	steel fibor		4 -	Lecono		4 3	13+22	7 2 2 2 3
o root, invo 17 - and account per row) and alphy is -anex	3 1001, Inc.			FOOL BIOCKS WITH I I MOOR	F001 BI0			
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Remove existing turber things install recibballs frow-seasons	Romave			Timber Sels on Wood				
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CO OT 18th, WILLIAMST 18 SHEEKWEIT	CO OT THE				_			
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asts with shortrate on bedrock or a minimum of 2 ft below								_
posts when deteriorated) issued in the rooting for direct	posts with							_
the book of the bo								
Renlessment of wood footing blocks (and bottom of timbur	messions of trades represented the property of the state							
II NO LOURS IT I I ST I I ST I I I I I I I I I I I		N Height above for, in	Set Specing, 11 Y/N	Type Set Sp			То	From
		4.	t	Zir()ii)				OWN
Rename Shed Said Rockboth Shekimb Contrib Traber Sets Continents	Comments	Concrete Cush		i ining	nair I avai			ę

	oper Level 3.4 (ft) 1020 Roparr Level 5 (ft) 1020 epair Level Ropairs should be completed immodately to <6 months Repairs should be completed in 0 to 12 months Repairs should be completed in 12 - 30 months Repairs should be completed in 12 - 30 months Repairs should be completed in 12 - 30 months Ropairs should be completed in 12 - 30 months Repairs should be completed in 12 - 30 months
COST ESTIMATE FOR REPAIR LEVELS 1 TO 5 Est Total Stack Sets (No) Est Total Rockbolts (LF) Est Total Concrote (cy) Est Total Tamber Sets (No)	COST ESTMATE FOR REPAIR LEVELS 1 AND 2 Est Total Sted Sets (No) Est Total Roccholls (LF) Est Total Roccholls (Cy) Est Total Shotcrote (cy) Est Total Timber Sets (No) 1
O (Est Unit Ratics \$5300/por sot)	O (Est Unit Rates \$5300/per set) 75 (Est Unit Rates \$85/per LF) 76 (Est Unit Rates \$110/per CY) 62 (Est Unit Rates \$1000/per CY) 25 (Est Romoyal Unit Rate \$1800/pe
Est Total Construction Costs Est Total Construction Costs Est Total Construction Costs Est Total Construction Costs Est Total Construction Costs Est Total Construction Costs Est Total Removal Costs Est Sub Total for Repairs Est Sub Total for Repairs Contingency (20%) \$205,858 Contingency (20%) \$274,475 Est Total of Construction Cost \$1,852,706	Est Total Construction Costs Fix Total Construction Costs Fix Total Construction Costs Fix Total Construction Costs Fix Total Construction Costs Fix Total Construction Costs S00 S100 Est Total Construction Costs S100,000 Est Sub Total for Level 1 and 2 Repairs \$1 178,375 Mobilization (15%) \$176.756 Contingency (20%) \$235.675 Est Total of Level 1 and 2 Construction Cost \$1,580,806

24-1-03505-002 ODOT Rail Study Coos Bay Tunnel 18

ODOT RAIL STUDY TUNNEL 19 Coos Bay Subdivision, Oregon MP 745.62 to 746.41

39+59 39-97 39 39-97 40-02 5 40-02 41-00 98 41+00 41+07 7		39·28 39·28 7 39·28 39·33 5	38+88 38+84 16 38+84 39+21 37	37+93 38-26 33 38-26 38-50 24 38-50 38-68 16	37-93	35+36	35+62		32*70 33*70 80	\$ k	32-40	<u>26+76</u> <u>32+20</u> <u>544</u>	26+76		11+31 11+38 5	<u>. </u>			10+86 10+91 5		0+00 0+35 35 0+50 15	0.00	Station Length, ft Repair Level
Shotcrete over Bedrock Shotcrete over Bedrock Shotcrete over Bedrock Shotcrete over Bedrock	Shotarete over Bedrock Shotarete over Bedrock	Shotoreto over Bedrock Shotoreto over Bedrock	Shatareta over Bedrock Shatareta over Bedrock	Shotoreta over Bedrock Shotoreta over Bedrock Shotoreta over Bedrock	Shokarate over Bedrock Shokarate over Bedrock	Shotzate over Bedrock	Shotcrete over Bedrock	Shalarete over Bedrock	Sholorete over Bedrock	SIGNORAL OVER DEGLOCAL	Sholcrote over Bedrock	Shotarete over Bodrock	Shotarele over Bedrock	Shoursts over Bodrock	Shotcrete over Bedrock	Shotcrele over Bedrock	Shotcrete over Bedrock	Shotarete over Bedrock	Shotorete over Bedrock	•	Shoicrata over Stori Sets Shoicrata over Stori Sets		Type Lining
	z z			zzz	z z :	 		2	Z 2	z z	2	 z 		.	Z	z	z	 X	z z	2	****	٧	Set Spacing, ft Y/N Height above TOR, in
2 0"-thick) Spains abolizes in harnol crown (5'45') Shoturets applied over bodrock, shotcrets cover is thin in general (0.5" to 2 0" thick) Spailing shotcrets in turnel crown (7'x5')	2 0" dack) Spaling shokasts in Juniel crown (3"X2") Shokasts applied over bedrock, shokasts cover is thin in general (0.5" to	2 0"-thick) Spalling shoktgate in funnol crown (5"x4") Shoktgate applied over bodrock, shoktgate cover as thin in general (0.5" to	2 0"-thick) Two 5 to 10"-wide patches of this spalling shotbroto in turned crown Shotbrote applied over bedrock, shotbrate cover is thin in general (0.5" to	Patches of this spelling shotcrete in hunod crown Spalling shotcreto across turinol crown (~ 20' wide) Spalling shotcreto western half of turinel crown (~ 10' wide approx.) Spalling shotcreto mestern half of turinel crown (~ 10' wide approx.) Shotcreto sociale desir bedrock shotcreto crown is then in centeral (1.5' to	Spaling electrete in tunnel crown (< 0.5'-freck application) Shotcrote applied over bedrock, shotcrate cover is film in general (0.5' to 2.0' thick)	Shotcrote applied over bodrock, shotcrete cover is thin in general (0.5" to	Sholorete applied over bodrock aholorete cover is thin in general (0.5" to 2.0"-fluck) Proches of spelling shotcrete in turnel crown (0.5"-1.0"-fluck application) shotcrete inscriptions and scattered small rock transports on cround	Area with patches of spaling shotore's in turned crown (0.5°-1.0°-theologication), shotore's fragments on ground (no rock fragments) - track and disches are very muddy and carry wood debns (condition continues to S-Ports)	on stea, at sea 42-70 Shotzrele applied over bodrock shotcrele cover is thin in general (0.5° to 2.0° thick)	Area with spaling shokrete (8x5 and 10x4) in turnel crown (< 10°-titick application), spaling shokrete fragments on ground scattered small rock fragments on ground scattered small rock fragments.	fall sholcrets (regments and small rock fragments on ground Sholcrets applied over badrock, shokzets cover a thin in general (0.5" to	Spaling shotzeta across turnel crown (- 20 wide) associated with rock	Spaling ethicrete in hanel crown (~ 6*15 wide area) associated with rock (at, shotorete fragments and small rock fragments on ground	Shotcreta applied over hedrock, shotcrete cover is thin in general (0.5" to 2.0"-thick), color changos in shotcreto (light-gray and dark-gray) suggest multiple applications or previous shotcrete repair work. Sight drap from E-apringtine at Sta 13+60. Both dichos are sized up and muddy again starting at around Sta 26+00.	Spaling shotcrete in tunnel crown (~ 5x3) associated with rock fell, shotcrete fragments and small rock fragments on track.	Shok rate applied over bedrock, shotcrate cover is thin in general (0.5" to 2.0" thick)	Spaling shotcrete in turnel crown (~ 5%3) associated with rock fall, shotcrete fregments and rock fragments (largest rock ~ 4%2%1) on track and in ritidate	Shokrata applied over bedrock, shotcrofe cover is thin in general (0.5° to 2.0°-thick)	Spaling shotcrets in turnel crown (- 5x5), shotcrets fregments on tech	2 0" thick) 10 2+10 (approx.) S'ourved track 10 2+10 (approx.) S'ourved track 40 2+10 (approx.) S'ourved track 41 2+10 (approx.) S'ourved track 42 4+10 (approx.) S'ourved track 43 4+10 (approx.) S'ourved track 44 4+10 (approx.) 44 4+10 (approx.) 44 4+10 (approx.) 44 4+10 (approx.) 44 4+10 (approx.) 45 4+10 (approx.) 46 4+10 (approx.) 46 4+10 (approx.) 47 4+10 (approx.) 48 4+10 (approx.)	Shotzme - 6" that, over sized sets, dry, fouled tracks Shotzme - 6" that, over sized sets, dry touled tracks Shotzme - 6" that, over sized sets, dry touled tracks Shotzme another over before the shotzme cover us thus no seneral (0.5" to		Comments
			- ! • • • • • • • • • • • • • • • • • • •		<u> </u>	•	-			- ,		-			the easting shotcre'e cover and the dry state of the tunnel however	the spalled areas. Due to the generally thin shotcrote cover now spalling of shotcrote has to be expected in the future at any	prevent further weathering and distinct as on the bedrock and potential rocklate, this will also help to prevent the spaling from progressing into the coasing shotzete application surrounding	areas 4"-thick) within the next 48 to 60 months in order to	unversity descriptions, rowever, spesing structed was observed at everal locations in the hunnel some associated with small rockfails, it is recommended to cover exposed bedrock in		In general, the shourzele application over bedrock appears to be		Repairs
		1 [1.1	1 1 1	LIT					Ī					1	1					11		> #
+++	- - - - - - - - -		2684	2378 1778 ————————————————————————————————		2016					 		3168						-				Stael Sets Rockboks Shotcrete No Rows UF Nº c

Table 6

Table 8

TUNNEL 19 Coos Bay Subdivision, Oregon MP 745.62 to 746.41 **ODOT RAIL STUDY**

42+02 42+02
Total Length (ft)
Ropair Lovel 4-5 (ft)
Ropair Lovel 5 (ft) From To 41+07 4<u>1+38</u> 41+38 4<u>1+47</u> 41+47 42+02 Repairs should be completed immediately to 48 months
Repairs should be completed in 0 to 12 months
Repairs should be completed in 12 - 30 months
Repairs should be completed in 30 - 48 months
No immediate repairs required based on the current conditions Length, ft 3911 3911 Rapair Level Shalarate over Bedrock
Shalarate over Bedrock
Concrete Type Lining Concrete Curb
Set Specing, ft Y/N Height above TOR, in Est Total Shorter (cy)
Est Total Shorter (cy)
Est Total Shorter (cy)
Est Total Shorter (cy)
Est Total Shorter (cy)
Est Total Shorter (cy)
Est Total Timber Sets (No) Shokerete applied over bodrock, shokerete cover a thin in general (0.5" to 2.0" thick)

to 41-38. Seepage at springline elong W-adewell

Spalling shokeret in hunnel crown (9"x4")

Concrole Barris

South Portal @ MP 745-41. Shin slides at the east side of the portal area occurred in the post and resulted in blocked drainage (muddy track and datches inside the tunnel) Repairs 3 g ļ No Rose LF **18**

Repairs should be completed immediately to <8 months
Repairs should be completed in 0 to 12 months
Repairs should be completed in 12 - 30 months
Repairs should be completed in 30 - 48 months
Repairs should be completed in 30 - 48 months
No immediate repairs required based on the current conditions

Est Total Steel Sets (No)

Est Total Steel Sets (No)

Est Total Rockbolts (LF)

Est Total Concrete (cy)

Est Total Shockrete (cy)

Est Total Timber Sets (No)

Est Total Construction Costs \$0.000
Est Total Construction Costs \$0.000
Est Total Construction Costs \$60,000

Est Total Construction Costs \$60,000

Est Total Removal Costs \$7,110
Abolutzation (15%) \$14 567
Contingency (20%) \$19 422
Est Total of Construction Cost \$131,099

Shannon Wilson Inc

0	28 241	60 1728	0 6264	0	2	8	Total			ŀ	ŀ			874	Total Length (ft.)	Į	
								South Portal @ MP 750 28		Z		Concrete Portal		٥	8:74	8+74	
							Seepage from crack in west sidewall at Sta 8+45	Soopago from crack in west sidewall at Sta 8+45				Concrete Barrel		\$	8+74	9÷20	
							One zone in crown at Sin 8+41.	Drip zone in crown at Sta 8+41.	_								
					_		 Scowerno behind concrete benefiel contact at Sta 8+20. 										
								spalled shotcrete in grown at Sta 7+62 (3'x4')				Shotcrate over Bedrock		£	# 20	7+26	
ļ	-	j.	ĮŠ	<u> </u> 	 		(including sidewalls, 2-linex, spelled areas, 4-mick)			2		Shatcrete over Bedrock		12	7+26	7+14	
_		,	}				Cover exposed bedrock in areas where shotcrete is spalling	Spalled shotcreto in crown (1238)		_							
			_		_			Generally thin shotcrete ever bedrock, Dry, Muddy Track		Z		Shotcrate over Bedrock		60	2	£	
		14	1584				(including sidewalls: 2"-thick spalled gross 4"-thick)	obanos sucidos on east was (5 x2x)				Shokatele over Bedrock		8	ů.	0+32	
	+]	_	1	_	ļ	Course averaged had not in cases where shelp-size is seed as	March Control of the				SOUNDED 1940 BRIDGES		ű	0732	/R+C	
						_		Generally thin shotcrote over bedrock, Scallored small drip localisms.			_	Shakaala aasa Badaal		ř	b 3		
	06	1056		<u>!</u>	<u> </u>	!		section at 3'-apacing	6	3' Y	8 4' and 3'	Shotcrete over Steel Sets		44	5+87	5+53	
								of 12 shool sots at 4'-specing generally last 3 sets at the south and of									
							s require the application of sholcrete at each end of the section	crown. No signs of instabilities or rock falls were observed, Section consists frequire the application of shokerete at each and of the section									
							backfill the void space with comentoous material. This may	touch and support ground in crown, locally), Overbresk is 3°-5' high in		_							
	_						Establish a buildhoad on both onds of the steel set section and	Shotcreted steel sets to bridge overbreak/cave-in area (steel sets do not		_							
		٤	12.5	+						Z		Shotcrete over Bodrock		45	5+53	5+08	
			-					- Spalled shotcrete in crown at Sta 5+48 (3'x3')									
	_							 Spaling on east wall at Sia 5+37 (2x2) and Sia 5+49 (4'x6') 		_							
								scattered rock fall as indicated by debras on tunnel floor,	_					•			
					_			with bodrock exposed between Sta 5+24 and 5+38, associated with									
					_		Tell his can at which are worted	200 Citate of the 12 Ci	-								
-							maniformed shadorals cover	See S.14 (1/27) See S.21 (5/27) and See S.22 (1/27) issue continue of the S.14 (1/27).									
	_	_			_	_	series alls) in 4" (over exposed bedrock) thick shed fiber	shrirming from Sia 5+08 in 5+24 with some spation at Sia 5+10 (4'x4')	_	_	_				_		
			_				repair and secure the area with a 2" (over costing shotcrato in	- 5 to 7-both overtrook area between Sta 5+08 and 5+38 across crown.									
							addition to occasional mokfalls evidentiv) it is recommended to	reminrand Dry in conneral									
		_					Due to relatively large sue of areas with spalled shotcrete (in	Genorally than shotcrote cover, especially in crown. Shotcrate is not									
			L	-				- Spalled shotcrata in crown (3' x 1') at Sta 4+11		Z		Shatcrete over Bedrock		335	5+08	1+/3	
			_					- Seepage in west wall at roughly -Sta 2+70 (fault?).									
	_							- Spance shortcook (2x2) along wear at all Sta 2+46 (2+5) and 2+56,		_					-		
								western springure							•		
								- 3 IOODOIS SCHIMBUII COMI DOIMBBII CIG 2773 GIN 2720 CIII) BINNYO		_							
								E coefficie acultonal la comun habitata Sta 3133 and 3130 dan about		_					•		
								Spelled shakerale in comm (25-21) of Sta 24-10		_							
-								- 9 moking scattered in crown between Sta 1+75 - 1+85									
			_					reminmed Dry in nameral		_							
ļ		ļ	_ _	1	1	<u> </u>		Generally thin shotcrete cower asperativ in crown. Shotcrata is not		<u> </u>	1			ļ		1	
	672 124	69	576		N	0 0	stori sats at each end of the section		30	_ ~	20 25	Shotepho over Stad Satu		20	1.73	1	
	_						andication of shotcreto and the construction of two additional										
							word space with comprised as material. This may require the	of the section. Dry			_		•		-		
								shotoroled sleet sets, orded up at the bottom of the east adewall at each and			_		ω				
							established - atool sets only work as "canopy". Establish a	crown Loose bedrock material, originating from open ground behand			_						
		_	_				actively deteriorating and failing out no ground support	louch and support ground in grown). Caved-in section is 10'-15' tagh in									
							Exposod bedrock in overbreak/caved-in area is instable and	tou op stas leets) eare UFovea/yleardjovo ooplud ot stes loats beteralods		-					1		
<u> </u>			_	<u> </u>				- Bedrock exposed in grown between Sta 1+43 and 1+53			_	Shotcrete over Bedrock		8	- \$	\$ \$	
								remiorced. No cracks observed			_						
								Generally thin shotcrete cover, especially in crown. Shotcrete is not									
	<u> </u> 	<u> </u>	<u> </u>	<u> </u> 	<u>'</u>			- Scattered drops around Sta 0+42		z		Concroto Barrel		5	•	98	
		_	_					- Open crack (1/4"-wide) in cast sidewall at ~Sie 0+25			_						
	-							 Thin crack with seepage on west adowed at ~Sia 0+09 									
								Generally dry to damp,									
								North Portal @ MP 750 12		N		Concrete Portal		0	0+00	0+00	
į	١	١	t		1	اً ا			Height above TOR, in	t	Set Spacing, ft	Турю			Jo	From	
No.	2	†	†	Power LF	1	2000	Kapura	Comments	Concrete Curb	۲	1	Pojer	Repair Level	Length, ft	Station	S	
Ti-less Carry		4	1		ı		P	.		l					۱		

ODOT Rail Study
TUNNEL 21
Coos Bay Subdivision, Oregon
MP 751.21 to 751.30

Repai	Repart	4+78	4+24		3+63			0+55								0+00		000	From	2
Repair Level 5 (ft.)	Repair Level 4-5 (ft	4+78	4+78		4+24			3+63	_							0+55		940	To	Station
) 17	308	•	<u>\$</u>		<u> </u> 92			308								뚕		0		Langth, ft
0	<u>. ca ca</u>											i.							Г	Repair Level
		Concrete Portal	Concrete Berrel		Shotcrete over Stool Sots			Shotcrete over Bedrock								Concrete Berrel		Concrete Portal	Туре	Lining
					25											1			Set Spacing, ft	
		z	2		-			z								2		Z	N/A	
			· 		 			ì											Height above TOR, In	Concrete Curb
		South Portal @ MP 751 30	- Most with some dripping at Sta 4+32	Dry in general	- Scattered spalling between Sta 3+83 and 4+24).	- Wire mash exposed at ~Sta 3+75,	Non-reinforced shotcrete over steel sets, Dry,		- Thin crack in crown 4 rockbolts in crown at -Sin 2+40	- 4 rockbolts in crown east of center line at ~Sta 1+84	- 3 rockbolts in crown at Sta 0+70	bedrock debns and shotcrate rebound paid along both scrowalls,	4" of sidowalls (weathered sendstone with scattered sitistone layers),	tunnel fire. Shoicrete is steel fiber reinforced, Exposed bedrock at bottom 3" order to provent excessive weethering and deterioration of	Shotcrete cover generally in good condition, Shotcrete was applied after E	0+10	In general dry. Thin crack across concrete barrol with some seepage at Sta.	North Portal @ MP 751 21		Comments
	ioua											spalling of the existing shotcrate application	exposed sandstone which could result in undermining and	order to provent excessive weathering and deterioration of	Extend 3"-thick shotcrete cover to the base of the sidewalls in					Repairs
	٤		_															Ļ	3	Steel Sets
	2		<u> </u>	_	<u> </u>		_	_	_	_	_	_	_						Rows	\vdash
	9		 	_	-			<u> </u> 			_						_		* %	Rockboks
	3030	г	_	_	_			3696										_	-	Shotcrel
	8	-	╁		 			<u>2</u>								<u> </u>		<u> </u> -	9	*
	<u>c</u>	-	1		L			<u> </u>	-			_						<u> </u> 	Q Q	Concrete
	ع	+	<u> </u>		-			_						_		<u> </u> -		-	١.	Timbe
	ا	,I																		Į₽

	\$34,000	Est Sub Total for Repairs			
	8	Est Total Removal Costs	(Est Removal Unit Rate \$1600/per sot)		Est Total Tumber Sets (No.)
	\$34 000	Est Total Construction Costs	(Est Unit Rates \$1000/per CY)	2	Est Total Shotcrote (cy)
 	8	Est Total Construction Costs	(Est Unit Ratos \$110/por CY)		Est Total Concrete (cy)
	8	Est Total Construction Costs	(Est Unit Rates \$85/por LF)		Est Total Rockbolts (LF)
	80	Est Total Construction Costs	(Est Unit Rates \$5300/per set)	0	Est Total Steel Sota (No.)
				AIR LEVELS 1 TO 5	COST ESTIMATE FOR REPAIR LEVELS 1 TO 5

Repairs should be completed immediately to <6 months
Repairs should be completed in 0 to 12 months
Repairs should be completed in 0 to 12 months
Repairs should be completed in 12 - 30 months
Repairs should be completed in 12 - 30 months
Repairs should be completed in 30 - 48 months
No immediate repairs required based on the current conditions

Mobilization (15%) \$5,100 Contingency (20%) \$6,800 Est Total of Construction Cost \$45,900

Table 10

Shannon Wilson, Inc

24-1-03505-002 ODOT Rail Study Coos Bay Tunnel 21

ODOT RAIL STUDY ESTIMATED CONSTRUCTION COST SUMMARY Coos Bay Subdivision, Oregon

					Repair Level	182 (Incl.2-3)					Repair Le	epair Level 1 to 5		
						Romove		ESt Total				Kemove		ER 10/28
	Milboat D 7-		Steel Sets	Rockbotts		Timber Sets		Construction	Stoel Sets	Rockbolts		Timber Sets		Construction
Tunnel #	Portal	Length (R.)	(No)	Ð	Shotcrete (cy)	(No)	Concrete (cy)	Cost	(No)	(LF)	Shotcrete (cy)	(No)	Concrete (cy)	Cont
Tunnel 13	669 47	2496	-	0202	429	9£		\$696,763	-	9126	1243	150	-	\$3,048,179
Tunnel 14	681 09	121							•		98			\$89,100
Tunnel 15	720 73	2143	9	2600	Z	2		\$609,480	9	9914	624	376		\$2,769,242
Tunnel 16	721 52	633			•		•		•	•				 -
Tunnol 17	727 70	1200			.				•	480	8	14		\$136,620
Tunnel 18	734 48	1580	•	9209	462	125		\$1,580,806	•	7035	536	149		\$1 852 708
Tunnel 19	745 62	4202			•						191		-	\$257 850
Tunnol 20	750 12	974							7		8		241	\$131,099
Tunnel 21	751 21	478	•		•				0	0	\$34 000	0	0	\$45 900
	Totals	14077	9	10745	97.5	235		\$3,099,049	8	26555	36758	658	241	\$8,330,695

21-1-03505-002
ODOT Rad Study
Coos Bay Subdivision
Construction Cost Summary

Table 11

Login BAC

Friename J (241)(03505-002/24-1-03505-002 Fig 1 dwg Date: 09-25-2008



Map adapted from 1:24,000 USGS topographic map of Noti, OR quadrangle, Provisional Edition, dated 1984.

ODOT Rail Division
Rail Tunnels Assessments
CORP Coos Bay Division Review

VICINITY MAP TUNNEL 13

September 2008

24-1-03505-002

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FIG. 2

Filename, J-241/03505-00224-1-03505-002 Fig 2 dwg Delex 09-25-2008

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Map adapted from 1·24,000 USGS topographic maps of Clay Creek; Walton; Greenleaf, and Roman Nose Mtn, OR quadrangles, all Provisional Editions, all dated 1984.

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VICINITY MAP TUNNEL 14

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FIG. 3

Nename J 1241103505-002124-1-03505-002 Ftg 3 dwg Date 09-25-2008 Login BAC

VICINITY MAP TUNNELS 15 AND 16

September 2008

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24-1-03505-002

FIG. 4

NOTE

Map adapted from 1:24,000 USGS topographic map of Fiorence, OR quadrangle, Provisional Edition, dated

Fishname, J. (241)03505-002/24-1-03505-002 Fig 4 dwg Date 09-25-2008 Login: BAC

1984.



Map adapted from 1:24,000 USGS topographic map of Fivemile Creek, OR quadrangle, Provisional Edition, dated 1984.

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VICINITY MAP TUNNEL 18

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24-1-03505-002

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Geotechnical and Environmental Consultants

FIG. 6

Filename J 1241103505-002124-1-03505-002 Fig 8 dwg Date 08-25-2008 Logm BAC



Map adapted from 1:24,000 USGS topographic map of Reedsport, OR quadrangle, Provisional Edition, dated 1985.

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VICINITY MAP TUNNEL 19

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24-1-03505-002

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FIG. 7

Filename J 1241103505-002124-1-03505-002 Fig 7 dwg Date 08-25-2008 Login



Map adapted from 1:24,000 USGS topographic map of Lakeside, OR quadrangle, Provisional Edition, dated 1985.

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VICINITY MAP TUNNELS 20 AND 21

September 2008

24-1-03505-002

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FIG. 8

Flanama J.1241103505-002/24-1-03505-002 Fig 6 dwg Date: 08-25-2008 Login BAC